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# international photo technik

The magazine in English, German and French for applied medium- and large-format-photography.

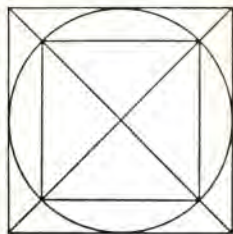
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## Front page:

The photo entitled "Mona Lisa" by Peter H. Fürst of Cologne is a portrait in the style of an Old Master. In an attempt to imitate the stylistic elements of Dutch painting, several points must be carefully observed: direction and character of lighting, type of background, make-up and the craquelé effect should all blend harmoniously together. In this case, the photographer asked the model to try and smile in such a way that the similarity with the famous painting became even more obvious.

Taken on 120 roll film Agfachrome 50 S  $2\frac{1}{4} \times 2\frac{1}{4}$  in. and printed via internegative. With reference to the enlarging technique involved, we would like to remind our readers about the contribution entitled: "New ways of picture enhancement" contained in IPT 4/76.

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# Is large-format photography still up-to-date?

This rather provoking and disastrously simplified question is not quite so flippant as it might appear at the first glance. Those of us who come in contact with "concerned" amateurs and pros have been confronted with this question often enough. In keeping with all generalisations, it is difficult to answer unless one becomes more specific and knows the given conditions. This is not the right place to discuss principles but to take a hard look at the facts.

They stormy development in the photochemical industry in recent years has raised the quality standard, especially as far as enlargement in colour photography is concerned, to an ever higher level. In addition, the working tolerances in the new working processes are laid down in a very precise manner. This means that in the case of outside or home processing, the user can expect a given standard. Any appreciable improvements in quality by means of personal manipulation are not possible. In black-and-white photography matters were, and still are, different. In spite of the use today of ready-packed materials it is still customary to employ special recipes. There is a whole series of film/developer combinations which are particularly suitable for specific purposes. Here is not really possible to judge the information transfer function at given degrees of enlargement. In colour photography, on the other hand, the situation is clearly cut. Yet, information transfer is only *one* of several criteria for the evaluation of the format issue and, in the present context, particularly in large-format photography.

First of all, let us take a closer look at one or two definitions: generally speaking film sizes are divided into 35 mm, medium format and large format. The accepted

limits are: up to 24×36 mm; 1¾×2¼ in. up to 2¾×3¾ in.; 4×5 in. and above. Actually, these limits ought to be modified. Since the ideal format and the 2¼×3¾ in. size are principally to be found in bellows cameras with adjustable standard and back, these formats should at least be included in the present definition of "large-format". This is absolutely in keeping with the improved performance of modern films and printing papers. It would seem that camera adjustability and information gained through a larger initial format (and hence smaller degree of enlargement) are two interdependent factors in an evaluation. They are prominent features of large-format photography. So we arrive naturally at the question why miniature and medium-format cameras have not as yet penetrated the domain of large-format photography, that of universal adjustability. This is also not a question of principle but one of expediency. As a matter of fact, all the features incorporated in a view camera could find application in the case of a smaller format, but the disadvantages are immediately obvious: such cameras would be heavier, more inconvenient, less flexible and more subject to faults.

One can just imagine the trouble of trying to examine the effect of a lens swing on a miniature screen. Direct focusing would only be possible by means of a powerful magnifier. Transfer of mechanical values such as film advance, shutter cocking, aperture control and mirror action could only take place via electric impulses since the three-dimensional movements which occur between the film magazine and the rest of the camera would prohibit any form of mechanical link. The same applies to an automatic, centre-weighted TTL exposure measurement. Any spacial alteration between the front and the rear of the camera would result in a different utilization of the light rays by the photo cells. There are a number of patents which tend in this direction but, as yet, there is no general economic solution. The replacement of mechanical functions to an increasing extent by electronic components is not all that much

help here: although mechanical values can be converted into electric quantities with reasonable accuracy, the factors dictated by the lens systems must, however, still be taken into consideration in their original, unchanged form. They must be converted into geometrical values and it is not possible, as a rule, to influence them.

In spite of progress in science and technology it looks as if the technique of camera movements will remain the domain of large-format photography for a long time to come. Even if there was no longer anything to be gained in using a larger format for the sake of the greater enlargement potential, there would still remain the need for camera adjustments. This means that the topicality of the large-format camera and the decision in favour of it is not so much a matter of photochemistry but rather of constructional economy. The principle of the bellows view camera with its adjustable standards is such a mechanically clever solution that it is hardly possible to improve it at present. It is extremely difficult to transfer this principle to a smaller format without incurring serious disadvantages. The reverse is not only conceivable but has also been put into practice: there are countless rangefinder and SLR cameras for the medium format which have adopted the features of the miniature camera with respect to operational convenience. The advantage of the latter over the 35 mm camera lies merely in the larger format. The countless possibilities inherent in a view camera due to its perspective controls have never been exploited here for the reasons given above.

Viewed in this light the question of the topicality of the view camera is not all that difficult to answer. It is still the best choice in all those cases where one wishes to manipulate the perspective and extend the depth of field. The larger negative area is therefore not merely a useful additional benefit but is dictated by the economics of engineering. Large-format technology is thus the most economic solution for those photographic assignments where the demands are most exacting.

"German Caviar" was the satirical name given to this vegetable by the Americans in the early postwar period. If the price of this commodity continues to climb, it might once again become a fitting description.

Photo: K. Ammerbacher, Nuremberg/Ingrid Kaminsky Agency, Hagen-Vorhalle.



# Steam locomotives By day and night

One of the photographer's favorite subjects is becoming increasingly difficult to find: the steam locomotive. As in most other industrialized nations, "Puffing Billy" has been almost entirely withdrawn from service in Britain, Germany and France. In comparison to diesel or electric locs they are slow, noisy and too great a burden for the environment — taken all round, they have simply become uneconomical. It is not without nostalgic regret that technically-inclined people see the last remaining examples of the steam engine disappear in the museums. In comparison to their modern counterparts with their stream-lined bodywork, the mat-black monsters had tubes, rods and couplings exposed to view. On account of

the mighty steam clouds emitting from highly polished valves they offered a sight which stirred the heart; on the other hand, the impression modern technology tends to leave on the observer is cooler and more matter of fact.

The passing of the steam engine signifies the end of a technical era which compasses the beginning and end of the industrial revolution and the mechanization of the means of production. It was the steam engine which enabled us to break through into the technical age. Of course, now that we are well into the age of automation and the "affluent society", such comparatively primitive means of traction are obsolete, although they were developed over the decades to a state of

technical perfection. It was, after all, a long way historically from the inauguration of the railway line between Nuremberg and Fürth in 1835 up to the express trains of the 1930s and later. This is reason enough to take more than a nostalgic interest in these machines; they are, rathermore, milestones in technological as well as railroad history.

Just as certain utilitarian buildings — such as pump houses, old machine halls, etc.—are put under the protection of the State in order to preserve them as documents of a past mode of living, so mobile objects have to be committed to museums for their safekeeping. In both cases it is only possible to retain a relatively small portion of these relics on account of their number and size. And this is where photography has an increasing role to play. Photographs of old steam engines have, indeed, become collectors items in their own right.

Normally such documentary photographs are taken by daylight, but it is the pictures taken at night which exhibit a particular charm. But then they are the most difficult to shoot. Illumination of a stationary machine is tricky enough, due to the absorption of light by the mat black paint. If one wishes to capture the



The heavily-laden goods train is being pushed as well as pulled.

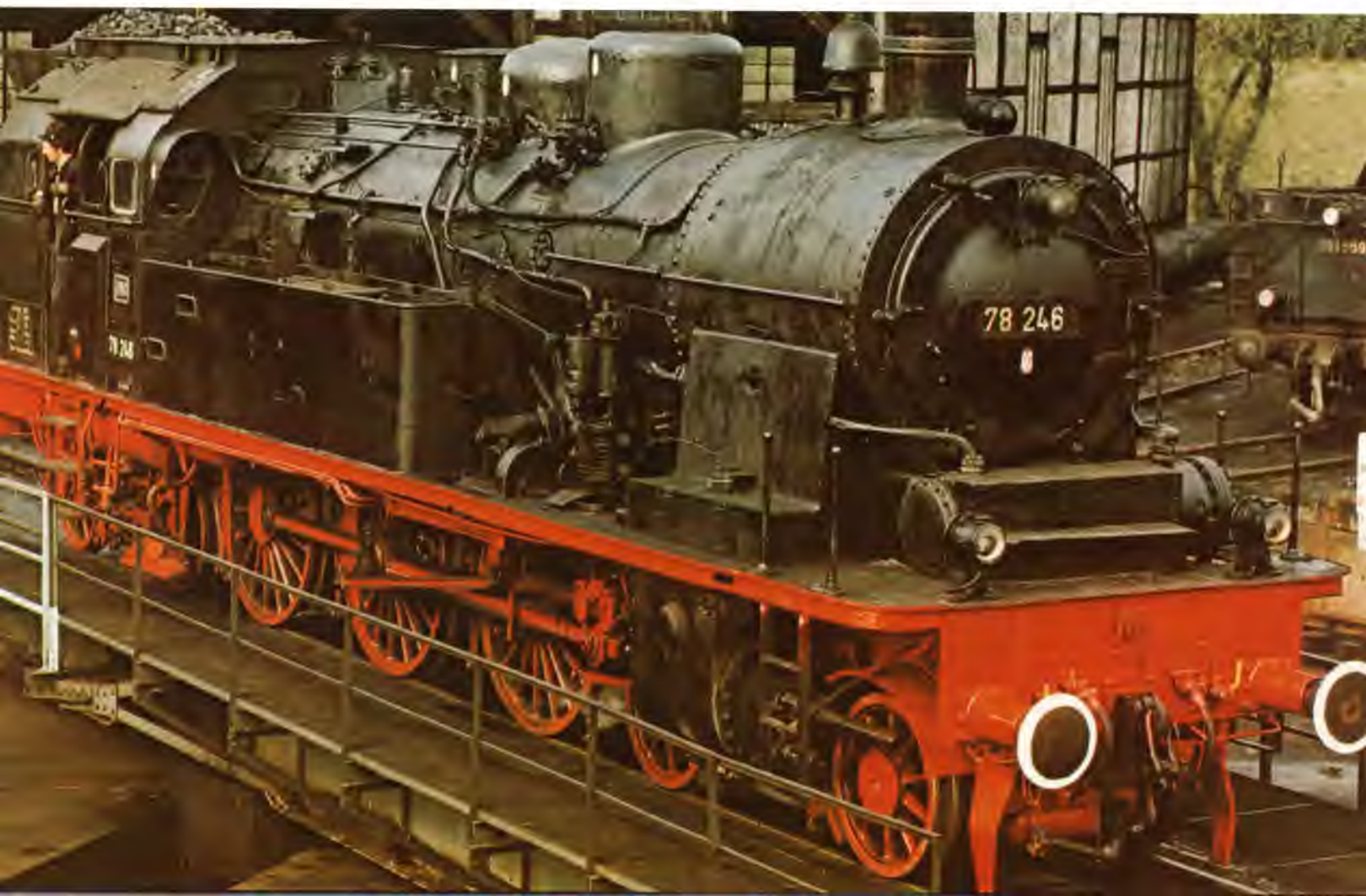
Photo: Dr. Raimo Gareis, Germany.

## *Color page opposite:*

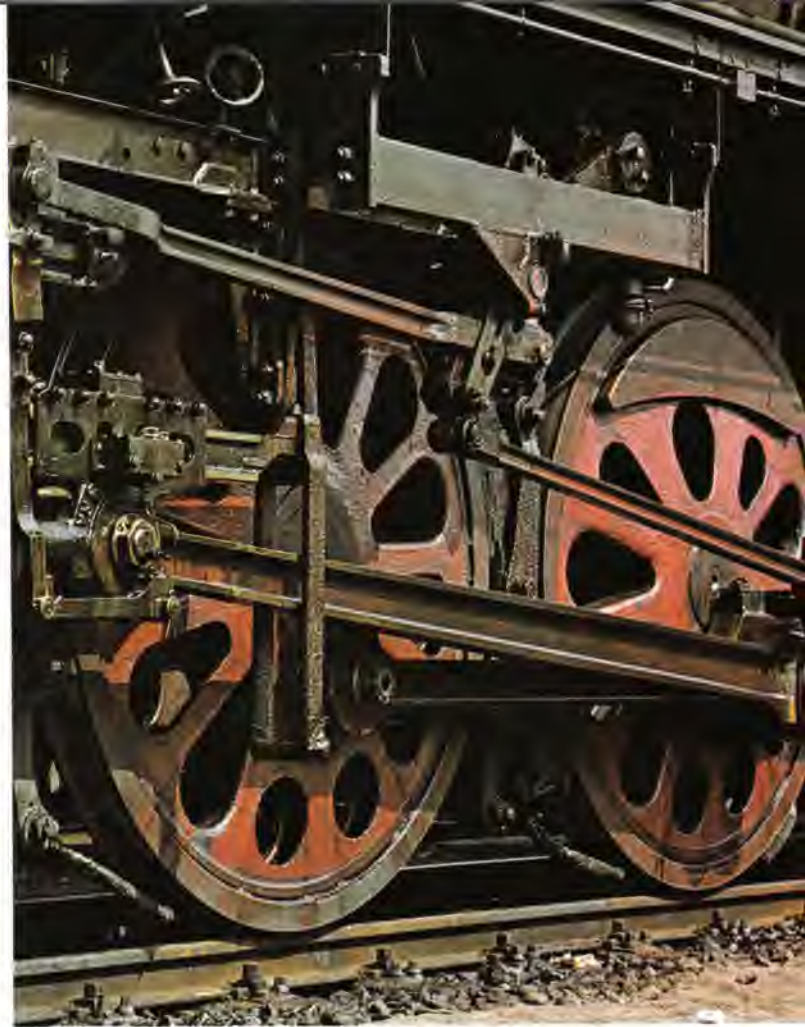
The veterans steam out of the shed for their last tour of duty. After such farewell ceremonies, the enthusiastic train-spotter has to look farther and farther afield to capture such locomotives "alive" on film.

Photos: J. M. Mehlretter, Munich; above pictures appeared in the "Lok-Kalender" published by the Motorbuchverlag, Stuttgart.





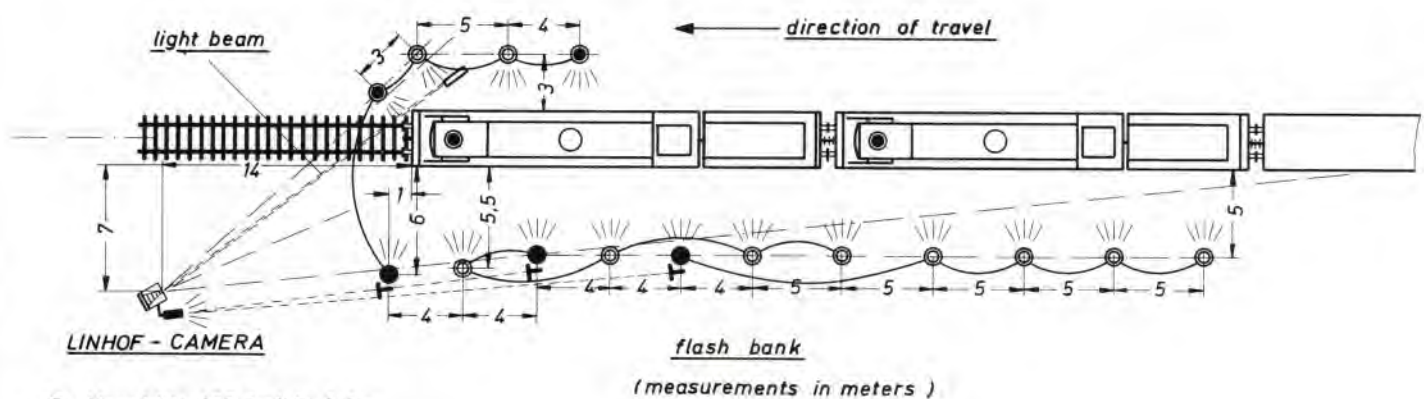








### Arrangement of the lighting units



- Mecablitz 402, height 2,2m
- ⊙ Mecatwin 402, height 2,2m
- ⊙ Mecatwin 402, height 1,2m
- Triggering flash Mecablitz 214
- ⊣ Slave cell Mecalux 10



dynamism of a traveling locomotive at night, special measures are called for. How ingenious one must be can be seen from the following contribution by J. Michael Mehlretter who employed together with Hartmut Thiele a "mobile flash studio" for locomotive photography.

### **"Ambush" on the embankment**

As the number of steam locomotives in service diminishes, the number of train-spotters, and hence the demand for good locomotive photos, has increased out of all proportion. A glance through the appropriate shelves of a bookshop will show that many new books on this subject have been published in recent years. Closer inspection will reveal that most of the illustrations are of trains taken by daylight in a station and only occasionally traveling through the countryside. Shots taken after dark are seldom and one practically never encounters a large-format picture of a locomotive speeding through the night. The reason is clear: the output of even the most powerful one-piece portable flash units is simply not high enough for such a subject.

#### *Fig. right:*

Winter shots of steam locs are more satisfying, because steam forms more readily at low temperatures.  
Photo: Dr. Raimo Gareis.

#### *Color page 8*

##### *Top left:*

Locomotive and landscape. Such harmony was only possible with the steam engine against a romantic background. The billowing smoke and steam blended with the clouds.

##### *Below and top right:*

A close-up view of the driving wheels. The mighty mechanism of connecting and control rods, as well as the heavily counterweighted wheels, is seldom to be seen on modern locomotives. A fascinating technical subject has vanished for all time.  
Photos: Dr. Raimo Gareis.

#### *Black-and-white page 9:*

Night photographs of traveling locomotives are rare, indeed. They call for a special kind of flash technology which is elucidated by means of the sketch  
Photos: J. M. Mehlretter, Munich.

What was necessary was a mobile flash set-up of studio proportions to adequately illuminate the locomotive on the track or possibly even an entire train. A compromise solution for several apparently contradictory requirements had to be found:

1. Modest weight and easily portable.
2. Quick to set up.
3. Adequate light output for the task.
4. Extensible.
5. Robust and only occasional servicing.

Such equipment was actually found on the market: the Metz Mecablitz 402 System.

This system has the necessary output, is not at all heavy and up to five additional lamp heads can be connected up to the generator at a reasonable cost.

The use of lead batteries is important, since they provide a sufficient reserve margin for the five heads and the state of charge is easy to check.

Our aim was to employ such a light barrage to capture locomotives in motion at night. We had visions of fascinating photos packed with drama and atmosphere. An additional stimulus was the knowledge that the Federal German Railways would soon withdraw the very last steam engines from service. We had to find out on which lines they were still to be seen and then locate a suitable, possibly elevated viewpoint; of importance was also an advantageous position for the flash bank. The choice was narrowed down even further by the fact that only a single-track railroad was suitable in view of the safety factor. Finally, we tried to avoid those stretches which had electric overhead lines, a requirement which it was not always possible to fulfil.

### **Flash-bank**

Our plans envisaged an illuminated stretch of about 150 feet. Assuming a range of 16 feet and an illumination angle of 60° horizontal and 46° vertical we needed ten lamp heads for the illumination of the side alone. Two further units were required for the front and three from the rear to pick out the steam exhaust and the funnel. The result of our calculations was three Mecablitz power packs to feed four lamp heads each. Since we did not wish the flash equipment to appear in the picture, we were limited, as the sketch indicated, to an angle of view of 30°. This meant a lens of 250 mm focal length for the 4×5 in. format. (Tele-Arton.)

All the lamp heads were to be mounted on stands with ball-heads at a height

ranging between 4 and 7 feet. The more powerful flash units were assigned the job of illuminating the locomotive itself (Mecablitz 402, guide number 130 for 50 ASA). The less powerful units (Mecatwin 402, guide number 90 for 50 ASA) were intended as fill-in or as illumination for the tender and first car, possibly even for a second loc. Connection of the units was by means of 32 feet of cable.

### **Flash-problems**

After such preparations it was a matter of fixing the date and hoping for a cold, dry evening for the first test shots, since steam becomes really photogenic only below about 12°C. The equipment was set up at the side of the track and the Telecomputer programed according to the conditions. Slave cells (Mecalux 10) were connected to the three main flash units and triggered, without sync. cord, by a Mecablitz 214 unit attached to the camera. As it turned out, this arrangement saved us much time and trouble. We discovered, through a trial run, that it was still possible to fire the main flash in this way at over 220 feet. To get as much of the subject as sharp as possible, the Linhof Super Technika was carefully focused according to the Scheimpflug law, since stopping-down was more or less out of the question. In this instance the rails were a great help.

Adjusting the individual lamp heads for even illumination had to be done with much patience, because we were obliged to visualize the non-existent loc in its three dimensions. The last few lamps were turned slightly to the side so as to avoid too hard a transition from light to dark. It took one and a half hours to get everything ready, and just as it was growing dark we managed to photograph the first train on time, as expected.







The Good Old Days seem to steam past in the shape of these Old Timers. Practically all of them have been taken out of service. Photos: J. M. Mehlretter.

It was not possible to check the exposure beforehand by means of Polaroid film, because test data obtained from the scene alone, i.e. without the dark mass of the train, would not have been reliable. For the same reason it was also not possible to check whether the output/range of the flash was adequate or not. (The Metz units have an indicating lamp which lights up to show sufficient power is available for a particular range/f-number/film speed combination. In order to avoid blurred lights (e.g. the three lamps on the front of the loc.) the shortest possible time which the flash system with slave cells permitted, a  $\frac{1}{125}$  sec., was selected.

On evaluating a series of test photos we realized that corrections would have to be made. The shots taken of the light-colored diesel locs during twilight were well exposed with detail in the shadows. Reflections on the high-gloss surfaces of these modern engines were somewhat disturbing, however. The steam engines, on the other hand, were  $2\frac{1}{2}$  stops underexposed on account of the light-absorbing, sooty black appearance. In spite of this disappointment we could, nevertheless, clearly make out the desired phan-

tastic mood of the working engines with smoke billowing from the funnel and steam hissing from the valves. For the next round we set the flash units at full power and exposed the Agfachrome 50 S sheet film as for 160 ASA (special development).

A further alteration was to extend the lamp stands by adding custom-made tubes and aiming the remaining heads at a sharper angle from below. This improved the lighting and avoided that "burnt-out" appearance of objects too close to the flash—such as grass and bushes in our case. The exact moment for releasing the shutter was determined by placing an electric lamp at a set angle and distance on the other side of the rails; the approaching locomotive broke the beam, thus giving an optical signal for the release of the shutter. If position is taken up only after dark, adjusting the camera according to Scheimpflug (swinging the lens standard) can prove very problematical. Our solution was to place two powerful battery-powered lamps on the rails at the beginning and at the end of the subject area. This gave us reference points for the ground-glass focusing. Even better for this purpose are burning torches, since they offer a larger, moving point of light.

On location, it is important that one person from a two-man team should always be on the lookout for on-coming trains whilst the other person lays, for example, cable under the rails. Brightly-colored clothing is also a sensible idea. It goes without saying that permission has been obtained beforehand from the local railway authorities. We, for example, were not only familiar with the traffic on this stretch but had also spoken to the station master and engine drivers concerned.

On our second try we obtained the pictures we had hoped for. We were even lucky enough to witness two steam engines pulling a train together. The first loc was bathed with a cascade of light in our "flash-tunnel", whereas the second was faintly outlined by the last flash units of the row. We were particularly happy about the powerful explosion of escaping exhaust steam.

We even tried out our flash plant during the day. The effect was to brighten up and render sharp all those parts of the driving gear which usually vanish in prints of steam engines, because the former are in deep shadow. Highlights on the bright metal parts was a further effective advantage.



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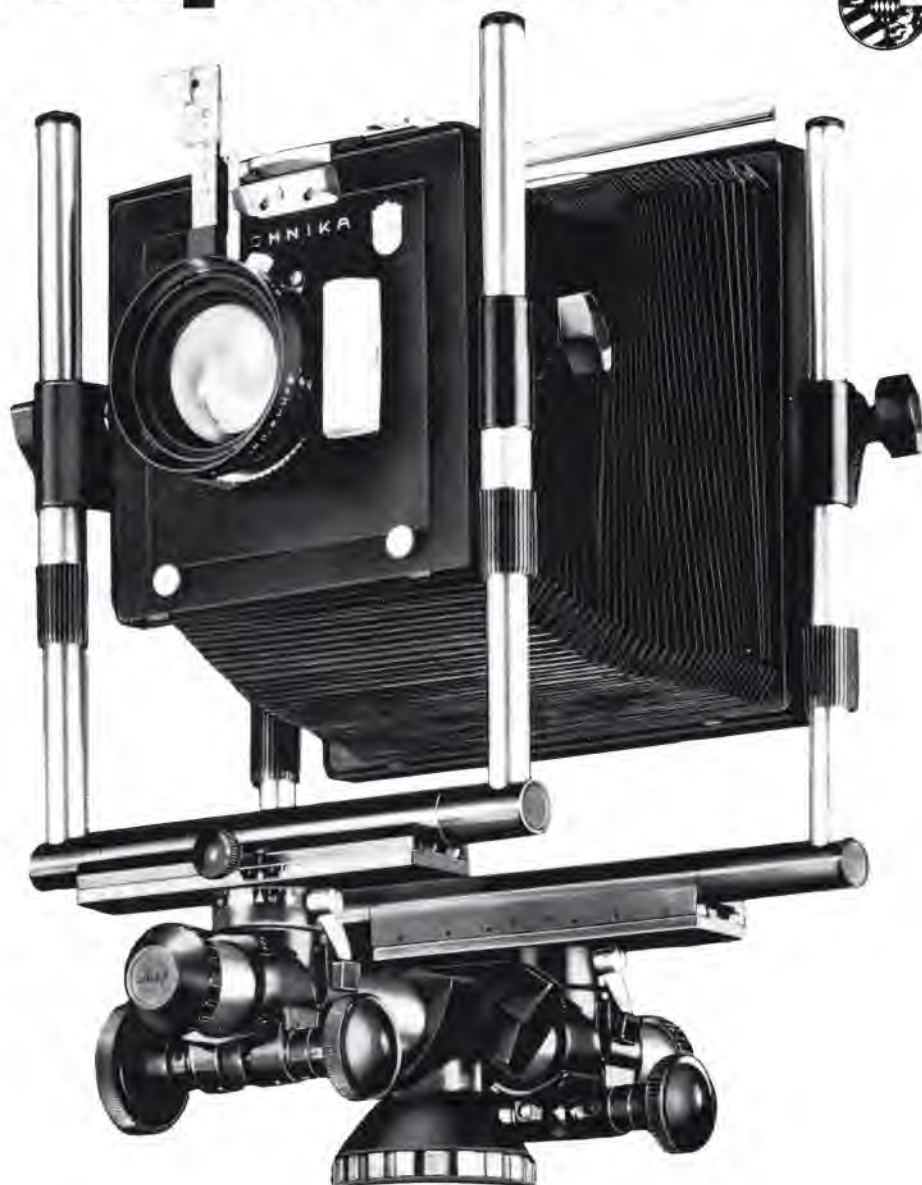
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|                                         |            |
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| Extension of monorail to lens standard: | 25 in.     |
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| Vertical rise                           | 6 3/4 in.  |
| Center swing around the horizontal axis | 360°       |
| Center swing around the vertical axis   | 360°       |
| Rear standard:                          |            |
| Total lateral shift                     | 5 1/2 in.  |
| Vertical rise for 4 x 5 camera          | 6 3/4 in.  |
| for 5 x 7 camera                        | 6 in.      |
| for 8 x 10 camera                       | 6 in.      |
| Center swing around the horizontal axis | 360°       |
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| Center swing around the vertical axis   | 360°       |



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The era of color photography with its impressive list of achievements tends to make us forget the weaker points of this omnipresent medium: the permanence of the image, the problem of how to keep the color values from altering in the course of time. What will the next generations find left over from the valuable pictorial documents created in the present decades?

even be aware that all these photographs will deteriorate one day due to environmental influences.

It is understandable that in their endeavors to improve the color rendition and ease of processing of color film the question of permanence played a minor role in the eyes of the manufacturer. Now that the most elementary requirements of this nature have all been satisfactorily fulfilled,

ive experience about a few selected products and within a necessarily limited space of time. Conclusions about products on the market at present are not reliable, because their characteristics can only be estimated through artificial ageing tests. It is difficult to simulate such processes in reality and, one should not forget, the properties of color emulsions are undergoing constant change at the hands

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## ***Closing the documentary gap in color photography***

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The results of research into this subject have not been published so far; it is as if the topic was best kept out of the trade press. When one considers that all of the current color photography—irrespective whether in the form of paper prints, negatives or transparencies—will have deteriorated so much in the next couple of decades that it merely retains a pale shadow of its former splendor, then it is clear that the problem must be brought to the attention of those concerned without further delay.

The advantages of color photography are unlikely to be exploited in historical archives and picture libraries until such time as it has been scientifically proved that the image dyes will not fade. Documentation of our present culture is only kept to a very small extent in official records and archives. A much greater quantity of picture material is to be found in private collections, both professional and amateur. Such private persons are not in a position to improve the keeping properties of photo emulsions and some may not

it would seem time that we all gave some thought—and publicity—to the problem of dye permanence and sought ways of overcoming this drawback.

Consumers should not be allowed to blame the photographic industry entirely for the present state of affairs. It will not recognize the need as long as it is not compelled to adapt itself by the market. When one takes into consideration the potential demand for self-processing photography, dry treatment of color prints, etc., the market is, however, only of modest proportions. The trade would be ill advised, on the other hand, to decline to recognize the need to carry out more research into the permanence of color products. It would run the risk of obliterating the records of its own development and prevent any progress being made in the preservation of colored pictorial documentation. In the final analysis this can be in nobody's interest.

Seeing that so little research has been published on the permanence of color images, it is only possible to offer subject-

of the manufacturer. First of all, let us take a look at the experience which has been gathered in the black-and-white sector:

The problem of how to keep photographic materials has become more acute in recent decades on account of the increasing atmospheric pollution caused by industry and the more widespread use of plastics, paint and stainers. The causes of damage to or deterioration in emulsions can be divided into three categories as follows:

1. Characteristics of the emulsion resulting from the manufacturing process employed.
2. The manner of development.
3. The prevailing storage conditions.

*With reference to 1.:* Original archives which date back to the time of the Second World War are practically all based on nitrocellulose. On account of the fire hazard and self destruction through the formation of nitric acid this film backing is not suitable. Important documentation from this period has been copied, in most



cases, onto modern base material. The cellulose acetate emulsion support which came onto the market later did not have these drawbacks. Today it is common to find polyester as a backing, a material which guarantees excellent dimensional stability—provided it is correctly handled. Research has shown that polyester film is most likely to be damaged by high humidity. Hydrolysis may then occur; this manifests itself in brittleness of the material. High temperature combined with normal humidity has practically no adverse effects. Comparative tests carried out by Adelstein and McCrea have proved the superiority of polyester films, especially where high temperature and UV-radiation are involved.

*With reference to 2.:* Consequences of faulty processing: The most frequent cause of deterioration in films is inadequate removal of thiosulphate from the emulsion at the washing stage. As is known, the silver image then converts into silver sulphide. The only sure prevention: proper fixing followed by generous washing. The same reason is behind the poorer keeping properties of the "Copyrapid" photos. Additional washing afterwards is also a help here. Mechanical damage should also be included under the present heading, because it permits oxidizing gases (from increasing pollution in conurbations) easier access to the emulsion grains. More about this in the next chapter.

*With reference to 3.:* Consequences of long-term storage: The most important factors to be considered here are bacterial damage and the effects of oxidizing gases. The former is less frequent today and only occurs by open storage in warm-humid conditions. Where this damage is imminent, one should pack the film together with a quantity of fungicide, such as sodium salts of pentachlorophenole. Some final baths already contain antibacterial agents which can also be used for color films without detriment. The greatest chemical hazard for stored photographs and negatives is known to be traces of oxidizing gases. Their importance is due to the fact that the changes take place cumulatively over long periods of time and that, to start with, nobody could say for certain where these gases came from. An additional difficulty in the detection of the cause of such oxidation damage is the fact that it manifests itself in quite a number of forms:

- Very small and numerous, sharply-defined spots with a diam. of about 0.01 mm which appear silver by reflected light

- Sharply-defined round spots of about 0.1 mm diam. which occur principally adjacent to scratches and have a brownish yellow coloration. Again silver by reflected light.
- Unsharp patches in the dark background surrounding bright portions of the image but which do not encroach on the highlights of the negative.
- Unsharp patches of red to orange hue. Film scratches are the most vulnerable place for this phenomenon.

These defects can occur in all manner of silver emulsions irrespective of base type. The consequences are a reduction in contrast and a mat, opalescent coating on the surface. Such phenomena can be simulated under artificial conditions by exposing the film to an acidic atmosphere rich in oxygen. If the concentration is high—which is unlikely to occur under normal storage conditions—the result is a diffuse yellow staining and bleaching of the silver image.

Photographers who have been in the profession a long time have probably noticed such phenomena in their own materials. The time required for such defects to become noticeable may vary from a few years to several decades. The formation of spots or patches as described and the loss of contrast apparently have the same cause. The silver ions released by the oxidization process diffuse into the emulsion or film base. Any foreign bodies present in the emulsion may act as a catalyst. In this respect silver powder, zinc powder, iron filings, soot, potassium iodide, sodium thiosulphate and sulphur are particularly active. Various plastics and staining liquids are also known to be at the root of mysterious picture deterioration. In the first case the destruction is caused by the emission of phenol and formaldehyde from the chipboards penetrating the emulsion layer. The oxidizing effect of the oxygen in the atmosphere is then accelerated.

In addition the following chemicals and materials are known to be destructive to films: peroxide, spruce (whitewood), resinous paint, fresh PVC, certain kinds of adhesive tape. Also diesel fumes and traces of ozone in the air (UV-light, electrostatic photography) can be harmful.

Rooms where one proposes keeping photographic materials should be free of exhaust fumes and dust. Avoid rubber bands, adhesive labels and tape.

When long periods of storage are envisaged, one should keep such films in dry rooms (30 to 40% humidity) at a tempera-

ture of 5 to 20°C. If cans or metal boxes are used, they should be zinc plated and not sealed with adhesive tape. It is most important to observe that sufficient time should be allowed for the film to "become acclimatized" before closing the lid firmly. This is the present state of knowledge which has been drawn from research and empirical evidence in black-and-white photography over the past decades. There is no reason why many of the measures should not be applied to color photography as well, but this would not cover all the problems which arise, of course. It is at least clear that as far as the storage of color negatives and transparencies is concerned the same conditions apply. Experience gained from non-scientific tests have led to the following conclusions:

- Slides framed in glass are more vulnerable to deterioration; here several factors seem to be at play. Worthy of note are the formation of bubbles or spots of varying origin, a flattening of contrast and deterioration in sharpness
- Fresh natural woods and stains can have disastrous effects
- Kodachrome and Agfachrome transparencies (also Agfacolor) since 1957 exhibit good keeping properties
- The considerable differences in the emulsion coatings of color negative films prevent one from making any generally valid claims

It is absolutely undisputed that dry, cool and dark storage is beneficial to color films. Air should be permitted to circulate around the film packs. It is also obvious that the leading film manufacturers have made creditable progress as far as the long-term stability of their emulsions is concerned.

It is now up to the consumers to exert their influence and demand from industry more information about the keeping properties of the materials they use. If an independent research institute were to carry out a systematic investigation into this subject and publish its findings, this would be very much to the benefit of all concerned, including the manufacturers. The latter are bound to have experience which would be most useful in such an enquiry. Research of this kind could pave the way for color photography to assume a much more important role in contemporary documentation.

At the present time one is still obliged to copy momentous records of our age onto black-and-white film, which implies not only a loss of information but involves additional cost.



# *The storks of Altren*



Similar to the rest of Central Europe, the number of storks which breed in freedom has also been decreasing in Switzerland since the turn of the century. The reason for the change in habits of these birds is not really certain. The fact that they can find less and less to feed on has probably played a major role. Storks are omnivorous birds, yet their favourite nourishment are frogs, small fish, mice and insects. Ambitious projects to drain the marsh land have led to a decreasing number of frogs and other fen-dwellers which might have served as food. Also the increasing amount of wire fencing and power lines have also endangered and narrowed the living space of these birds. It is highly likely that there are many other factors which have contributed to this regrettable state of affairs. The fact remains, however, that not a single pair of storks has bred in the Swiss countryside since 1950.

The storks feel quite at home on the sandy ground of their large enclosure.  
This stork was so tame that it ate from the hand of the gamekeeper, Mr. Heiri.





An observant young man, Max Blösch, noticed the decreasing number of storks many years ago and decided to investigate the cause and to see whether he could do anything about it. His first step in this direction was to take a stock of all the eyries still occupied in Switzerland. To this end he drove to all the places where he knew there were stork's nests, registered and photographed them in 1939, hence long before the general public had become conscious of the need for protection of the environment. He combed the immediate neighbourhood on a bicycle and for more remote places he borrowed a motorcycle from a friend.

The idea of rearing storks and then releasing them in favourable countryside had to be dropped, since lack of means and the Second World War with all its consequences soon put an end to such dreams. It was not until 1948 that he was able to set about realizing his plans. Since there were no longer any storks living free in nature, it was now a matter of trying to get them resettled in the country. In the meantime Blösch had become a teacher in Solothurn where he made friends with a retired gamekeeper called Arnold Heiri who shared his passion, put his land at his friend's disposal for the resettlement experiment and even offered to take care of the breeding. Later Blösch built himself a chalet between the enclosures and now lives there. Step by step the enclosures were built up, all with his own hands, and today the game preserve is known across the borders of Switzerland and visited by many thousands of tourists each year.



*Top:*

The young storks begging for food.

*Below:*

The parent regurgitates nourishment for its fledgling.

*Right-hand page:*

*Top left:*

The author with his Linhof Kardan B mounted on a high tripod. Although the distance from the nest was quite short, the birds did not feel at all disturbed.

*Below right:*

Lovers chaffing, as usual.





This was naturally not intended, but was not so regrettable either. Since the experiment was also meant to provide scientific information, there was always a certain number of experimental birds kept permanently in captivity. In the course of the years these birds have reared a host of fledglings. In the spring of 1976 they numbered 81, but not all of them survived. In order to persuade these young birds to assume habits of life similar to those living free in nature, the majority have not been hindered in any way for several years now. The only thing they have to tolerate is being ringed. That is to say, they may fly away as soon as they are capable of doing so. Since the older storks drive the young away from the nest anyhow, this is what actually happens. 1973 was the first year in which all the young storks left Altreu, made their way to the south and even took some of the previous generations along with them.

Those who stayed in Switzerland do not seem to be particularly troubled by the winter climate. This does not mean to say that they enjoy low temperatures: If they feel cold, those of them who can fly usually land near the river Aare. There they have discovered a sandbank—in about five inches of water which never freezes—where they stand in a long row. I photographed them there on the 1st January, shortly after daybreak, at a temperature of about  $-7^{\circ}\text{C}$ .

All the storks at Altreu are ringed. They wear a large aluminium ring—bearing Swiss Cross and number—above the leg joint where it is more easily readable. In 1975 a total of about 23 storks with such rings were registered somewhere in Europe, captured or found dead. Of the latter, they were four in number, three had come to grief on electric power cables, a modern invention which, as mentioned at the beginning, makes life more difficult for these birds.

The photographs accompanying this contribution were all taken in Altreu. Max Blösch, for whom photography has always been an important means of documentation since the start of the resettlement project, is prepared to help the visitor in his photographic endeavours if he can.

Text and photos: Friedrich Reichardt, Switzerland

The original plan of breeding the storks in Altreu and trying to make them settle in various places up as far as the Lake of Constance was a failure. The storks did not remain in or near the prepared nesting places, migrated and did not return. The leader of the project decided to alter his tactics. He clipped the wings of the storks and kept them in captivity on the preserves for years, even in winter. Here the male storks were readily able to find a partner, and in about their third year they were placed in a larger enclosure where their feathers could grow again. In the following year, at the beginning of the breeding season, they were brought to a site which was considered a suitable nesting place. After a short period of acclimatization they were released, and the majority of them accepted the carefully prepared nests and began to mate.

All seemed well, but further unforeseen difficulties cropped up. Although the storks were now completely free and could fly wherever they wanted, they showed no inclination to fly to their natural winter quarters in Africa. The storks had been prevented from migrating in the fall for four years and now preferred to winter in their accustomed surroundings. They sought their nourishment in the rivers, on the fields, at the inns and farmhouses. Punctually at feeding time they would fly down and land in the enclosures which were open at the top and, together with the younger birds with clipped wings, would receive their evening meal. And today they are still doing it.





# DOORS AND GATES

Gates mark, no matter whether they are visible or invisible, some form of real or symbolic boundary. Boundaries divide space and countries, they divide the inside from the outside, the secular from the holy, finite from infinite. That which is divided, however, strives to be united again. The gate is the point at which the enclosure is penetrated and where man has the freedom to pass from one region into another.

Gates and doors originally signify the entrance to a building and this creates the possibility of shutting the door. The origin of the word "castle" means "a place cut off, separated". He who turned the key in a door or slid the bolt across felt himself safe from the outside world. Yet sad is he who is locked in by another's hand from the outside, for then he has exchanged his freedom to lock himself in for the agony and humiliation of prison.

In honour of the glorious victors and rulers of ancient Rome triumphal arches were erected, the passage of which was regarded as the climax of a celebration. They associated the character of a gate with a notion of a monument.

## The door in the eyes of the philosopher

In an essay on the subject "bridges and doors" the philosopher Georg Simmel symbolizes the door as the limit in front of which man constantly stands and has to decide whether to proceed or not, whether to withdraw himself or to open his heart. In and Out have always entertained a close relationship with one another. It is the very nature of a door that both directions are equally possible and valid. Most languages have made good use of the allegory powers inherent in the words door and gate and have taken account, above all, of the one-sided aspect, a definite goal in one direction. One thus speaks of the "gateway to knowledge" or that "fortune knocks at the gate". The parting of the ways in one's

destiny have been symbolized by a gate since time immemorial: "the gate of life and death", "the gates to heaven and hell", "the gate to eternity".

## Doors and gates as cultural objects

Practically all races of the world connect doors and gates with some idea of magic and religious performances. The importance of the door as an entry or passage is emphasized by magic procedures, observation of cults and solemn rites. In the course of centuries countless ritual ceremonies have thus come into being which aim at forbidding the entry of evil spirits and, instead, bring down the blessing of the gods on the house. Such ceremonies range from cruel sacrifices—which entail smearing the threshold and doorpost with blood of the victim—down to peasants' customs of the present day in which the origins of the practices are still faintly discernible. For example, the skulls of cattle or horses' hoofs were placed under the doorstep, and even today a horse's shoe is often attached above the door to bring luck. In many countries of the world it is customary to place signs, symbols or inscriptions above the door, for example, the house doors of Ancient Babylon bore red painted hands, and Mohammedans still do the same with passages from the Koran.

Throughout the entire Christian Middle Ages the portals were the place where legal proceedings were carried out. It was here that marriage ceremonies took place. In customs and legal practises handed down through the ages much of this notion is still to be found today amongst the common people. In some regions, for instances, oaths were sworn on the threshold, and the handing over of a house to a new owner was consummated by touching the doorposts.

In the Bible Jesus also spoke of himself as being a "door" and invited believers to pass through him. The design and sense of the church portal, as it developed over

the centuries, should be seen in this light. In the early days of art history those who regarded the entrance to a church merely as a form of decoration did not do justice to it with their formal aesthetic point of view. In the door to a church we find, rathermore, a synthesis of all the previous notions ever felt about a door or gate: the gate in its simple function as a point of entrance, as a seat of judgement, and as a means of lending dignity to a building. All these conceptions are spiritualized through Christian symbolism for which the gate is the threshold to life. *B.B.*

The illustrations accompanying this contribution, whether taken by professionals or amateurs, all have one thing in common: attention to detail. Those people who still take an interest in apparently insignificant details and can give their imagination free play will also have a ready ear for all the wonderful stories which the knothole in a door or the weatherbeaten posts of a stone gate can recount.

*Color page right*

*Top left:*

Who can fail, on looking at this picture, to feel himself transported back to a former age and to visualize a large country estate with servants quarters and stables.

Photo: Klaus Köhler, Idar-Oberstein.

*Bottom left:*

Photo: Verband Deutscher Amateurfotografen-Vereine e.V., Augsburg.

*Top right:*

Photo: Erich Bauer Studios, Karlsruhe.

*Bottom right:*

Photo: Klaus Köhler, Idar-Oberstein.

*Color photo page 22:*

Photo: Klaus-Peter Exner, Baden-Baden.











# The immortal nude

Hectic, technological and automatic—that might be a fitting description of the present age, an era in which life has been made less arduous for mankind, but which has degraded him in so many countries to an insensate being. We are living in a world in which one innovation follows close on the heels of the last. Trends come and go, and even in the field of art and other creative activities it is seldom that a particular line or school of thought prevails for long.

One special field of photography, on the other hand, has continued to enjoy unfailing popularity for several decades: the nude. Even the sex and pornographic vogue was not able to assume its place. Nevertheless, both parties carry on a sort of pseudo-contest between themselves, each tries to justify its existence in its own way. Whereas the sex or porno-photography endeavors to live up to its function of an "appetizer", the nude hopes to appeal principally to the observer's appreciation of art. It is, of course, an undeniable fact that trite pornography sometimes assumes the guise of "nude" in the hopes of being accepted by Mr. consumer (or Mrs. for that matter).

It is very wrong to think that only men are capable of judging what is good photography of the nude. Women also possess a skilled eye for the correct depiction and evaluation of a nude study providing they still have a normal attitude to their own body and can look at the figure of other members of their sex without feeling jealousy or rivalry of any kind.

## A word in favour of the male nude

It is only fair here to let a woman express her viewpoint for once on the highly disputed subject of the male nude. In spite of opinions to the contrary, it is a sign of false arrogance to maintain that a man in

Adam's costume is not aesthetically photogenic. The naturalness and supreme beauty of ancient Greek and Roman statues modelled on young men are evidence enough to prove the contrary.

Does such a thing as „classical nude photography“ exist at all today? It is not possible to answer this question with a clear Yes or No. Anyone who has taken either an active or passive interest in nude photography will have noticed that during the last ten years a marked change has taken place. Although the technical aspects are not so different, the attitude of the public to the nude has become freer. Today there are practically no limits to the phantasy of the photographer and many pictures which would have been laid aside with disgust ten years ago are readily accepted by an increasing proportion of the public today.

Yet the risk of crossing the border into vulgarity is particularly great in the field of nude photography. Certainly, where art is concerned, one is entitled to one's own opinion. But somewhere or other the limits must be set and observed, otherwise the model is degraded to a mere object of sexual interest. It is then of little importance how much technical skill and know-how the photographer invests in the sitting. Nowadays it is not difficult to persuade a young lady to pose naked in front of the camera. The large number of adverts in the local paper or photographic magazine "Photographer seeks model" or vice versa is evidence that results are forthcoming. It is much more difficult for the photographer to lend the sitting an artistic touch.

The interesting point about this photo is the contrast between the slim, immaculate body of the model and the sandy ground which is scattered with stones, grass and rubbish.  
Photo: Joel Boulay, France.







## **IPT Contest: Some examples of good nude photography**

A large number of outstanding pictures was sent in for the category "The Nude" during the recent contest organized by International Photo Technik. We would like to publish two examples in this issue: first of all, the black beauty on page 23 which was awarded the fifth prize; secondly, the nude model photographed in the smithy on page 27 which, although it did not win one of the main prizes, still attracted the attention of the jury.

The so-called "abstract nude", an experimental manipulation, was also well represented and made up about a third of the entries. The purists would probably say that even the use of a soft-lens attachment brands the photograph as "manipulated", an accessory which merely relieves the human body of its all-too-realistic poignancy. Especially those photographers who have an experimental leaning and have declared war on the stereotype approach have often found a satisfying subject in the nude study anyhow. The range of techniques is wide, some of the more popular ones being: black-and-white or colour sandwich, ultra-wide angle views, colour effects with filtered light, blurred movement, multiexposures, high and low-key technique, solarization and silhouettes with ornaments projected on to the body of the model.

Once again it is a matter of taste just how far the photographer should go in applying such techniques. It is usually fairly obvious when one particular form of manipulation is desirable. For example, should the photographer have a model at his disposal who is not quite as slim as one might wish, it would be a mistake on his part to keep to his favorite low-key technique. The result would be to render the not very graceful body even more massive than it already is. Apart from this, however, the variety and degree of manipulation is a question of attitude and personal taste and therefore not subject to general laws.

◀ André Petit of France succeeded in scoring a direct hit with this shot. His classical nude study in black-and-white draws its charm particularly from the carefully balanced proportions of light and shade.

### *Color photo right:*

This photo of a colored model won Maurice Bron, France, the 5th prize in the contest recently organized by International Photo Technik.













*Color photo left:*

A photo, which is bound to appeal to even the most hardboiled skeptic and bring a smile of acknowledgement to the lips of the professional. Imagination, grace and charm of the model as well as a dramatic atmosphere combine to form a harmonious entity.

Photo: Jacques Schumacher, Hamburg.

This rather delightful piece of fluff in the flimsy negligee was inspired to her antics by the photographer Hans Goersch of Stuttgart. Both "chocolate-box sides" of the model have come out well in this shot.

### **Amateurs on the advance**

Those delightful nude pictures based on some gag or daring to the point of risking censure—we have all seen them—are often not the work of professionals. Even the famous David Hamilton and Peter Basch started off in a small way, and even they have made way for other new stars. One particularly successful advertising shot, which must have called for courage at the time, was the very plump lady plus parasol who helped to promote Fuji films. Up until then the photographer who took this picture was quite unknown.

What struck us on sifting through the contest entries was that in many cases the most impressive photography turned out to be the work of a so-called amateur. In fact, the amateurs, a breed who are often the subject of derision at the hands of the trade, are capable of producing work which is not only technically perfect but convinces through its naturalness of expression, visual impact and attention to detail. This only goes to prove once again that it is often the unknown geniuses amongst us—in this instance the hobby photographers—who are capable of turning out pictures well worth publishing; it is only a matter of giving them the chance.







◀ The slender figure of a young girl reposing on a fur rug—a combination which seldom failed in the past to animate painters and photographers alike. W. Gasché of Bern added a third requisite to his nude study in the form of a wicker chair and, as one can see, the mixture works!

*Color photo right:*

This is a rather audacious nude composition in which the Ayes and the Nays will just about hold the balance. It was the intention of the Vorselman Studios in Amsterdam, which produced this photograph, to conjure up the most contradictory associations in the mind of the observer. The opinions are likely to be extreme: on the one hand enthusiastic applause and on the other hand crushing criticism. What pleased us about it was the nicely calculated contrast between the attractive female and the course manner of the blacksmith.



▲ W. Gasché, Switzerland.

◀ P. Gowland, Santa Monica, USA.  
Exact lightmessaring is necessary for showing all the intesting contrasts.











# MEXICO PORTRAIT

Mexico must be the country, more than any other, which stirs our imagination. The very name conjures up a wild variety of impressions we have gathered, heard or read: land of the cactus, ancient indian cultures, the conquests of Cortéz against the Aztecs, the Spanish colonial period and ensuing revolutions. And then there is the modern propaganda which extols the virtues of phenomenon such as "Acapulco" but which is typically un-Mexican.

Our trip was carefully prepared and was to embrace, of course. The abundant documents of the ancient Maya and Aztec cultures but, above all, was intended to capture the undeniable fascination of the people living in this strange land and make it comprehensible to all by means of photography.

The manifold aspects of the country offer the visitor an inexhaustible subject for contemplation and research, since even today Mexico has still not assumed the uniformity of modern nations. There are still millions of pure-blood indios living in tribes almost cut off from civilization and who speak their own tongue. The majority of the population is made up, however, of the so-called "mestizo", i.e. original indios who have mixed with the Spanish immigrants and who really represent the actual, modern "Mexican".

Mexico City is a surprisingly large metropolis with teaming traffic; almost a quarter of the entire Mexican population lives within the environs of the capital.

In order to realize a long-nourished dream, experience the real Mexico and get to know its people, it was necessary to hire a car and drive it 6000 miles in five weeks. Driving on the federal highways is no problem so long as one keeps an eye open for the odd donkey, horse or dog wandering along the road. We planned our itinerary in such a way that a hotel was in reach before darkness fell. We preferred to stay in the hacienda-style hotels or houses of Spanish colonial architecture. The road and hotel guide of the Mexican



Automobile Club (AMA) was a great help to us in selecting accommodation.

Photography of the natives calls for psychological empathy and much tact. There are moments when one must resist the impulse to raise the camera; an example might be the sight of a very poor Chamula indio dragging his pitiable wares to market followed by his children each laden with a heavy pack. Telephoto lenses are recommended and it is best to shoot from inconspicuous positions. Sometimes an exchange of confidence through the eyes is all that is required. Many indios, however, will turn their faces away, and it is not unknown for a tourist to have a vegetable fly past his ear after taking an indiscreet photo on a market place. Particular care should be exercised on Sundays, since the proud men might feel them-

This photo of a mestizo cemetery at Pátzcuaro illustrates the profound, uncomplicated attitude of the Mexicans towards their religion. On All Saints' Day Mexican families pay homage to their dead, spending the whole day beside the graves. For this special occasion the graves are freshly decorated with myriads of flowers and even the most modest tomb has been heaped up with fresh earth. The picture of the man standing deep in reverent thought in front of the grave has been "photographed through European eyes". The Mexican has actually a most uncomplicated approach to death. The All Saints' Day assumes almost a fair-ground character with the children romping around the graveyard. The receive candy in the form of a skull and sometimes bearing the name of the recipient; calaveras (caricature skeletons) are also popular.



selves challenged, on account of their religious beliefs, to act in an unforeseen manner.

On market day or similar occasions it is not all that difficult to break down the psychological barriers after spending some time—without photographing—amongst the people. There are all sorts of ways of making friends, such as by tasting the local fruit, admiring the children, and so on. Soon the hissing dies down (which warn the photographer not to shoot) and one is able to take the desired photo after all. A friendly “gracias”, a handful of sweets or a round of ice cream for the children smoothes over many a situation.

In the open country it was much easier for us to find contact with the people than in the towns crowded by tourists, where audacious begging has been learnt to perfection. We felt absolutely at ease in the countryside and were treated kindly as soon as we explained where we had come from and where we wanted to go. Of course, a certain command of the Spanish language is essential here.

The Mexican is a little reserved at first, but if one addresses him politely and in such a way that his pride is not injured, he can become very friendly, and praise of his beautiful country is a sure way of making him beam. Caution is really only necessary in the cities (which is true of the

rest of the world) where the upsetting of social standards and values can lead to aggression. For our part we had no negative reports to make and even the police were very understanding when we tried, on more than one occasion, to drive the wrong way down a one-way street.

The Mexicans have their own way of life, different from the Americans as well as the European, so do not always think a few pesos are the answer to everything: “grandeza” or a joke is often of greater value in their eyes.

On our tour, Mexico was to be seen at its best; it was October, just after a rainy period, and the whole countryside presented itself in an array of breath-taking colors. The scenery changed rapidly from mountainous valleys and pinecovered hills, to sub-tropical regions of dense vegetation. A chain of 125, 10,000-ft peaks, with an occasional 18,000-ft, snow-covered volcano in the background, gave way to placid lakes such as the Pátzcuaro in delightful Michoacán where one can find orchids growing in the forests between volcanic hills. The cactus-cliché impression of Mexico applies, if one so desires, to the north of this vast country. The abundant signs of by-gone indio cultures, each highly individual in its own way, the examples of Spanish colonial architecture to be seen in churches, monasteries and cities and the

endeavors of the people to create a modern Mexico make the country well worth while for the visitor. An excellent example of a harmonious synthesis of the original civilization and current modernity can be found in the Museo Nacional de Antropología in Mexico City which was established to arouse the Mexican's interest in the history of his race and land. Any visitor to this country should set out on his tour from this point.

*Dr. Harald Oertel*



#### *Color page 32*

Photo: W. Unger, West Germany.

The key to photography is the eye, the rest you can learn.

*Left:* The man with the straw hat—each region has its own individual type—is characteristic of the Mexican who appears rather introvert to us, cool, mysterious and convinced of his own manliness (“machismo”).

#### *Color page 28*

Typical of country scenes in Mexico is the heavily-laden donkey trotting along the side of a dusty road. The photo was taken in Bajío, the former bread basket of Colonial Spain in Central Mexico. Here a small group of donkeys, goats and dogs has been brought to a halt in order to bring them over the main road at a safe moment.

#### *Color page right:*

At the colorful Friday market of Toluca, where the rural elements of indio country life mix with drab city modernity, our attention was drawn by this young girl carrying her younger brother on her arm. Every time an attempt was made to photograph her she turned away. Nevertheless, she stalked us for a good hour and it became obvious that she was actually flattered and wanted her photograph taken.

All photos taken by Marie Luise Oertel using a Hasselblad and 150-mm Sonnar at f 4 to f 5.6.







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## Electronic focusing in cameras of the future?

45 years ago the Leica was the first camera to be fitted with a coupled rangefinder. This was a very important step forwards in the problem of getting one's picture sharp and, needless to say, nobody had even dreamt of coupling up an exposure meter to the diaphragm. Although there has been rapid development in recent years in the field of built-in exposure metering systems, it seems to be taking much longer to progress from the coupled rangefinder to fully automatic focusing. We are still waiting for the necessary electronics.

The most urgent demands for a system to keep the image crisp came from the motion picture cameramen: a motorized device took over the camera assistant's job of following up the actors as they backed away from the camera and vice versa.

The most common type of automatic focusing device today are principally photo-electric elements. Their advantage over manual methods of focusing is to be found in the fact that they are not subject to any personal discrepancies of the operator and leave him to concentrate on the creative side.

The most recent electronic focusers are so compact that it is no problem to integrate them in normal still or cine cameras. Leitz began exploring this domain about 20 years ago and as early as 1960 found it worth while to take out patents on their findings. It is a matter here of an electronic alignment and an analysis of the two sections of a coincidence-type rangefinder. The circuitry either generates a "sharp" signal if the two images are found to be identical or can induce the servomotor to adjust the lens a specified amount. Later Leitz patents take this idea a stage further and concern automatic focusing through the lens of an SLR.

At the 1976 Photokina Leitz demonstrated a converted SLR with the electronic focusing unit "Leitz Correfof". The image in this case is actually brought into focus by moving the lens mount manually. It was made clear that this was not a prototype of some future production model. Leitz were merely interested in testing the public's reaction and discussing the various possibilities and preferred methods of focusing.

Here are a few of the typical questions asked:

Would you be satisfied with a simple "sharp" indicator? (After all, this solution would be compact and cost less). Would you be prepared to pay for the more complicated technology involved in incorporating servomotors, not to mention the increased weight?

In a number of special fields, such as photomicrography, the main advantage is the fact that the photographer is relieved of certain operational, technical chores. In camera journalism, and sport photography, on the other hand, a motorized focusing system saves valuable time and gets the shot which might otherwise be lost for ever.

It should be pointed out, however, that an automatic focusing system cannot be relied upon in the same way as automatic exposure metering: the photographer must still decide which part of the subject he wants sharpest: there is no such thing as an "integral sharpness".

Ernst Leitz GmbH, D-6330 Wetzlar.



## Electron microscope with automatic camera

As early as 1962 Zeiss provided their EM 9 electron microscope with an automatic exposure control system. It was the first electron microscope to incorporate an integrated camera with such a patent feature. This is probably one of the reasons why this medium-caliber apparatus achieved such success on the international market for such optical instruments. When the Oberkochen optical manufacturer introduced the 100 kilovolt, high-efficiency electron microscope ME 10 a few years ago, it was realized that this was a bold venture in view of the international competition in this field. At that time this apparatus, which was likewise fitted with an automatic camera, made a considerable impression

on account of its ease of operation and excellent overall design. In the meantime it has secured a good portion of a highly-competitive market. A short time ago Zeiss were proud to supply the 100th microscope of this type.

## Linhof Horizontal/Vertical Centerpost

The Linhof designers have hit on a good idea here. This novel Horizontal/Vertical geared centerpost has universal application in conjunction with the following Linhof tripods: Expert Twin-shank Profile Tripod, Combi Profile Tripod, Lightweight Pro Tripod, Lightweight Hilo Tripod, Lightweight Reflex Tripod. This new accessory may also be mounted on the Minimatic Studio Stand.



On account of the almost unlimited degree of swivel and other adjustments, there are hardly any limits to the versatility of this geared centerpost. Irrespective of whether one is working in the studio or out of doors, combination of several items of tripod gear is very easy to arrange. For example, it is suitable for low-level work, as a movie titler or as a supporting bracket for flash or tungsten lamps. A further application is to be found in the field of slide projection. The various tripod parts are rapidly combined together in an ideal fashion, and any camera from 35 mm to large format may be mounted. Available in April or May.



## Large format — yet compact

A large-format view camera does not necessarily have to be "large". If you should come across a young lady carrying a smart aluminium case she might, of course, be a medical or technical assistant with her valuable instruments, an artist or even a fashion photographer taking along her entire large-format outfit, since Linhof have now brought out a new version of their 9×12/6×9 cm Kardan Standard view camera with a retractable monorail. This universal camera, together with three lenses, sheet film holders, roll film magazines and Polaroid back, fits nicely into the case mentioned (see picture).



Now that the Kardan Standard has become so popular—thanks, in part, to the slogan "Large Format—Light as a Feather" which claimed a weight of only 9.46 lb for camera, tripod and lens, Linhof have now followed up with a handy case such as was previously supplied only for medium-format cameras. The advantages of a larger format are well known: greater richness of detail, improved color saturation, perspective control and Polaroid adapters. Such an outfit now makes this kind of superior photography even more attractive to the serious amateur, the up-and-coming young professional and persons engaged in the fields of design, advertising, technology and art. This is especially the case when one compares the price with that of a high-quality 35-mm outfit.

## Residual-light video camera BM 8024

To utilize light levels as low as 2 mlx. in industry, medicine, security and education. The small, handy BM 8024 for black-and-white video recording can be employed at dusk or even after dark where the light level does not



drop below 20 mlx. It is even possible to get a usable TV picture (with a resolution of 200 lines) down to 2 mlx. of reflected light. The compactly-designed, highly-sensitive BM 8024 incorporates reliable printed circuits of the plug-in type and professionally-proven electronic components. The 1" "Plumbicon" television tube with fiber-optics input is directly coupled to the fiber-optics output of the one-stage video-amplifying tube. The lens mount is designed to accept conventional television lenses of the C-mount type. A wide choice of lenses is available to suit every kind of application. The camera is compatible with the CCIR scanning standard and can thus be used in conjunction with all other video apparatus to constitute a TV set-up adapted to specific purposes. The potential resolution of the camera exceeds 600 lines. Good television pictures (with a resolution of about 400 lines) may be obtained with a fast lens at full aperture at an illumination level of 20 mlx., and even 2 mlx. of reflected light will still result in a usable picture (resolution 200 lines). This camera thus has an application well into the night.

The use of the "Plumbicon" type of tube ensures that moving objects are rendered more distinctly than is usually the case with other types of tube which tend to suffer from the smearing effect under such conditions. The camera can be optionally fitted with the necessary electronic components to operate the motors of lenses with built-in power drive for the diaphragm; in such a case the aperture is then automatically adjusted to the prevailing light level. Provided this type of controllable lens also incorporates a gray filter, it is possible to set up the camera for automatic day/night operation.

## LDH 8334 video camera for outdoor applications

Philips have now introduced an ultra-modern system camera, with the designation "Video 35", for video recording out of doors. The LDH 8334 all-weather camera is thus suitable for the supervision of valuable objects, traffic and similar applications under extreme climatic conditions.

Due to its thermostatically-controlled heating, the camera works reliably at environmental temperatures ranging between -30°C to

+45°C and with a relative humidity of 100%. When fitted with the vidicon type of tube the camera is capable of supplying perfect pictures at a light level as low as 20 lux and assuming an aperture of f 2.



Automatic operation of the aperture is a standard feature of the camera, thus guaranteeing uniformly high image quality even when the illumination level fluctuates considerably.

## Improve your flash shots with Reflectasol "Soff Box"

Your own flash unit—or, in the case of studio equipment, the flash tube without reflector—is mounted within a "light chamber" which consists at the sides of the Reflectasol fabric "Super Silver" and, at the front where the light is emitted, of the diffusing material Reflectasol "Translucent". The rear of the side sections are black in order to avoid any undesired light effects.



The result is beautifully soft light in conjunction with any electronic flash unit. "Soff Box" takes the harshness out of electronic flash and gives you soft, diffuse light similar to that on an overcast day—the ideal illumination for portrait and still life.

Its modest weight allows you to transport it with ease; the largest model, "Super", measuring 106 x 106 cm, weighs only 1.3 kg!

Paul Teufel & Cie., Rosenbergstraße 113, D-7000 Stuttgart.



## Giant Kodak Colorama Taken with New Linhof Hand Camera

In New York's Grand Central Station, one of the largest and busiest railroad terminals in the world, Eastman Kodak maintains a 18 x 60 feet advertising display showing important and photogenic events as a giant illuminated transparency.

This famous Kodak "Colorama" display, in recognition of the Olympic Games that were held on the North American Continent, recently showed a picture of the opening ceremony of the Summer Olympic Games in Toronto.

The photograph for this transparency was taken with one of the first models of the new Linhof Technorama wide-field camera

which had just arrived in the United States at that time.

The Technorama is a special viewfinder camera for hand-held use which turns out dramatic 6 x 17 cm/2 1/4 x 6 3/4 in. panoramic pictures on conventional 120 or 220 rollfilm.

The transparency for the Colorama display was made from the original Vericolor II rollfilm negative and distributes such a tremendous wealth of color saturation and detail sharpness that it was possible to identify individual members of the Olympic teams present in the stadium.

The Linhof Technorama was introduced to the general public at the 1976 photokina exhibition and first deliveries are now being made to the trade.



## Large-Format Cameras Boost Real Estate Sales

For a number of years, a well-known real estate agent in Germany has been employing large-format equipment in its sales strategy with great success. More than 30 members of the sales staff are equipped with Linhof cameras and have been trained to use them as important tools to increase their sales.

Whenever a marketable property is being inspected, the real estate agent takes a few photographs, mostly in color, which in spite of sometimes severe limitations on location can mostly be shot in a favorable perspective, thanks to the use of adjustable large-format Linhof camera.

From the large format original, perfect prints with lots of detail can be produced quickly and efficiently in any quantity desired



and, aided by a suitable description, be mailed out to prospective clients without delay.

It is obvious that such a convincing presentation—with the property photographed in a truly professional manner—seldom fails to impress.

Currently, discussions are under way exploring new photographic possibilities by increased use of Polaroid negative/positive material and for special tasks, like architectural subjects with particularly wide landscapes, the new Linhof Technorama wide-field camera delivering a 2¼×6½ inch picture on 120 rollfilm, has been found particularly useful.

## Scope of Braun Tandem Projector further increased by means of Selector

The new Selector control unit permits programed operation of the standard Braun Tandem Professional with fourfold voltage switch-over since, apart from the two, 10-pole control sockets provided as standard, there are two additional inputs to accept the plug from the Selector control unit.



The Braun Tandem double projector thus becomes the first universal slide projector which may be controlled, and in a linear mode, by a choice of interchangeable programing units. E. g. it is possible to pre-select any slide from a magazine of 100, compare slides and introduce special effects such as sandwich, fade-in and dissolve.

Apart from the buttons for dialing slides in any desired sequence, there are also keys for selecting program functions such as cutting or gentle fade-over. A timer with variable steps is already incorporated. The micro process computer in the unit can be programed in a variety of ways for special purposes.

The Selector control unit is manufactured by Micronic. Existing apparatus in the Micronic system may be connected up to

the keyboard via a decoder (for example, the radio control unit consisting of transmitter and receiver). Connecting up tape recorders or cassette recorders is, of course, no problem. On playing back tapes with Micronic impulses, the synchronous state of picture and sound is maintained irrespective of tape speed, even fast forwards or rewind.

*Further information from:* Braun North America, 55 Cambridge Parkway, Cambridge, Ma. 02142.

## The Universal Negative Carrier — Linhof has the answer

What originally started off as two simple sheets of glass to hold the negative in an enlarger has now been perfected by Linhof.

Linhof is the first manufacturer to introduce a negative holder which combines the functions of a cassette for copying and a negative carrier for enlarging, irrespective of the format in question.

The Universal Negative Carrier can be used for all of the following applications:

1. It is suitable for sheet film 4×5 in./9×12 cm, 2¼×3¼ in./6×9 cm, Polaroid negative 73×85 mm and 73×96 mm, also for rollfilm sizes 1¼×2¼ in./4.5×6 cm, 2¼×2¼ in./6×6 cm, 2¼×2¼ in./56×72 mm, 2¼×3¼ in./6.5×9 cm and 70 mm perforated film. A glassless insert for 35 mm film is available as an extra.
2. In the Linhof Compact Copy Enlarger and Color 45, the negative carrier can be shifted around in any direction relative to the format mask which remains stationary and sharply rendered in the center. This ensures that optical conditions are utilized optimally.
3. A complex light-trap prevents light leaks while working with the carrier in the enlarger, which is a particularly valuable feature in color printing.



4. A rapid-change device retains the sheets of glass (top anti-Newton, bottom clear glass)

as well as glassless inserts to hold color slides in conventional sizes up to 85×85 mm and uncut 35 mm film.

5. With the aid of an interchangeable lower stage exact-register work can be carried out, supplemented in this way, the Negative Carrier always snaps into the same position in the negative stage. Pins hold punched film in exact register.
6. A cover plate excludes the entry of any light to the Negative Carrier/Copying Cassette.
7. A test positive—which is also supplied—facilitates correct adjustment of the image size and focusing.

The new Universal Negative Carrier serves for enlarging and reduction of all formats from 35 mm to 4×5 in., glassless inserts are available to hold 35-mm film as well as mounted slides of all sizes. Equally important is the fact, however, that this accessory is also a high-precision copying cassette with exact register, consistent location of the film plane and simple operation.

Considering the great utility and versatility of this new item, its price is highly favorable and compatible.



## 75-mm f 4.5 SMC lens for 6×7 Pentax

This shift, wide-angle lens is provided with the capability of correcting perspective and is therefore ideal for architectural subjects. The lens has a revolving mount so that the direction of shift may be orientated either vertically or horizontally in relation to the optical axis or at intermediate positions by virtue of click stops. TTL exposure measurement can, of course, only take place at the click-stop working aperture. (Available around 1977/78).

## 500-mm f 5.6 SMC lens for 6×7 Pentax

A newcomer to the range of Takumar lenses for the Pentax 6×7 is a newly-computed 500-mm telephoto lens with fully automatic diaphragm.

*Distributor USA:* Honeywell, 5501 S. Broadway, P.O. Box 1010, Littleton, Co. 80120.

## Polaroid Land Pack Film Back — ETR

The Polaroid Land Pack Film Back has been developed exclusively for use with the Zenza Bronica ETR and can be used interchangeably with the Film Back ETR for 120 and 220 roll films, thus greatly increasing the scope of photography possible with the ETR, as well as giving the user a means for previewing the light and exposure in actual shots before using other types of film.



The Polaroid Land pack films Type 105, Type 107 and Type 108, as well as Types 87 and 88, can be used with the Polaroid pack film back but, in any case, the actual size of the frame area with these two sizes of pack film will always be 42.5 mm by 55.1 mm which is the actual size of the 4.5×6 cm format used in the ETR.

The use of the Polaroid pack film back will give the user freedom to use various Polaroid films for obtaining instant black-and-white print, instant color print and instant black-and-white print with a negative.

## 70 mm Film Back — ETR

The 70 mm film back has been developed exclusively for use with the Zenza Bronica ETR and is the answer to those photographers who require more film in their branch of photography, whether it be fashion, news coverage, industrial, research, etc. The film back is easily interchanged with



the standard film backs for 120 and 220 roll films and is used without any substantial difference.

Cartridge-loaded double-perforated 70 mm film in 15 ft. length (say, 4.7 meters) is loaded in the film back and will permit up to 90 exposures in one continuous shooting session.



As with the standard film backs, the 70 mm film back is also attached or detached with the dark slide inserted into the slit on the front of the film back. After properly loading the film and taking three blank shots, the exposure counter is set to "zero" by simply pressing a button on the right side of the film back. The number of frames exposed is indicated by the exposure counter, up to 99, although 90 frames only can be exposed in this case.

## Gevaset 437 — a compact processor for phototype

Phototype, either in the form of film or paper, are processed rapidly and uniformly in the new Gevaset 437 machine. The designation "437" indicates that there are four baths and working width is 37 cm. The machine accepts rolls of any length or sheets of 12 cm or longer. The processed material leaves the machine absolutely dry after only 2 mins. 37 sec. Transport speed is 28.6 cm per minute. The G 437 may be set up next to the phototypesetting machine in a daylight room. It only requires an electric socket for operation; a mains water supply is not necessary.

Agfa-Gevaert Inc., 275 North Street, Terboro, N.J. 07608.

## Ceramics as a means of recording images

Ferroelectric ceramics from the mixed crystal system lead/lanthanum zirconate/titanate has drawn the attention of scientists in recent years, since it is possible to pro-

duce it in a transparent form through special sintering processes. When light impinges on a sheet of this transparent ceramic, the amount of transmission can be influenced through altering its state of polarization with the aid of an electric field. This phenomenon can be utilized to form an image in the ceramic material.



Scientists in the research laboratories in Munich have succeeded in building up ceramic recording elements by means of which up to 25 lines p/mm can be resolved. The reaction time of the ceramic element with the type of photoconductor used in this case lies within the region of one second. This is due not so much to the switching time of the ceramics (10 microseconds is average) but to the sluggishness of the photoconductor. Hopes that a real-time recording of television pictures might be realized one day are not pinned too high by Siemens, since even improved photo-conductors will hardly be able to gather the necessary current density to switch the individual picture elements.



Ceramics as an image recorder: The original a) is projected onto the ferroelectric disc b) and the portions subjected to light become transparent when they are polarized through the application of current. Even after more than twenty sequences of recording and erasing, the Siemens scientists were not able to detect any deterioration in resolution or contrast.

## Metz Mecablitz Universal Sensor

The Universal Sensor makes the Mecablitz CT 1 even more versatile than before, the range of lighting techniques now being almost inexhaustible. The accessory unit, at present in preparation, represents a novelty as far as its function and specification are concerned. In keeping with the CT 1 flash unit, it has a five-aperture computer capability which can be extended even further to embrace four smaller apertures, thus giving a total potential of nine f-numbers. One will realize the importance of this in close-up work. The power output may be finely dosed in seven stages by means of a dial, respectively, one may decide on the flash duration. The latter is of significance in series where the lighting is to appear constant, for example, when copying originals of varying brightness (reflective properties) which must be rendered faithfully with their original gradation. Moreover, one should realize that a pre-selected small output level will conserve power and get one up to 700 flashes out of one charge. An additional bonus then are very short re-cycling times which, in the case of fill-in flash in quick-sequence shooting, may be under one second. The fact that one can select an ultra-short exposure duration (as brief as  $1/10000$  sec.) means that fast movement can be frozen — such as the beat of a bird's wing.



The normal angle of acceptance of the Telecomputer may be reduced from  $25^\circ$  to  $12^\circ$ . This is of advantage when using telephoto lenses, since the photo-transistor of the Telecomputer only takes in the section of the object covered by such lenses and not the entire scene, which might otherwise lead to faulty exposure. The situation is similar in photomacrography where the background lies relatively far away from the computer in comparison to the object.

Set at a normal measuring angle, the result will be overexposure for the vital part.

The sensor is provided with its own measuring-field finder (accounts for parallax) so that it may be accurately aimed at the subject proper. For this purpose it may be swung in a vertical and horizontal direction.

Even with the Universal Sensor used remotely, the computer control elements, the ready light and the manual release button are all arranged in such a way that the photographer can glance at them from the shooting position. Synchronizing the sensor to the camera is effected either by means of the hot shoe or sync. cord.

Metz, Postfach 84, D-8510 Fürth.

Metz EPOI, 623 Stewart Ave., Garden City, N.Y. 11530.

## Componon S

The Schneider series of lenses with the designation "Componon S" are professional enlarging lenses computed to meet the most exacting requirements. The optical design of the lens (usually six elements in four groups), the choice of special types of glass and the manner of correction employed guarantee uniform field flatness, high contrast and excellent rendition of detail over the entire format. The almost perfect correction of all aberrations ensures that no compromises have to be made in color printing irrespective of the light source. Even in the case of extreme degrees of enlargement and when intentionally introducing perspective distortion, the correction of the Componon series is so well balanced that a deterioration in image quality is excluded.





## Componon S

The mechanical specification of the Componon S is in keeping with the special requirements of modern printing technology. The arrangement of the mounting thread at the rear is such that one does not require to unscrew the two halves of the lens in order to attach it to the enlarger. The aperture ring clicks into position at full and half f-numbers, thus facilitating setting in the dark. The f-number scale is absolutely linear.

| Aperture (1/300)      | 50    | 60    | 80    | 100   | 125   | 150   | 180  | 210  | 250  | 300  | 360  |
|-----------------------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|
| Relative Illumination | 1.0   | 0.8   | 0.6   | 0.5   | 0.4   | 0.3   | 0.2  | 0.15 | 0.1  | 0.07 | 0.05 |
| Exposure Times (sec.) | 1/300 | 1/250 | 1/200 | 1/150 | 1/125 | 1/100 | 1/80 | 1/60 | 1/40 | 1/30 | 1/20 |
| Exposure Times (min.) | 1/300 | 1/250 | 1/200 | 1/150 | 1/125 | 1/100 | 1/80 | 1/60 | 1/40 | 1/30 | 1/20 |
| Exposure Times (sec.) | 1/300 | 1/250 | 1/200 | 1/150 | 1/125 | 1/100 | 1/80 | 1/60 | 1/40 | 1/30 | 1/20 |
| Exposure Times (min.) | 1/300 | 1/250 | 1/200 | 1/150 | 1/125 | 1/100 | 1/80 | 1/60 | 1/40 | 1/30 | 1/20 |
| Exposure Times (sec.) | 1/300 | 1/250 | 1/200 | 1/150 | 1/125 | 1/100 | 1/80 | 1/60 | 1/40 | 1/30 | 1/20 |
| Exposure Times (min.) | 1/300 | 1/250 | 1/200 | 1/150 | 1/125 | 1/100 | 1/80 | 1/60 | 1/40 | 1/30 | 1/20 |
| Exposure Times (sec.) | 1/300 | 1/250 | 1/200 | 1/150 | 1/125 | 1/100 | 1/80 | 1/60 | 1/40 | 1/30 | 1/20 |
| Exposure Times (min.) | 1/300 | 1/250 | 1/200 | 1/150 | 1/125 | 1/100 | 1/80 | 1/60 | 1/40 | 1/30 | 1/20 |
| Exposure Times (sec.) | 1/300 | 1/250 | 1/200 | 1/150 | 1/125 | 1/100 | 1/80 | 1/60 | 1/40 | 1/30 | 1/20 |
| Exposure Times (min.) | 1/300 | 1/250 | 1/200 | 1/150 | 1/125 | 1/100 | 1/80 | 1/60 | 1/40 | 1/30 | 1/20 |

The Componon S series can be relied upon to solve every kind of optical problem in professional enlarging technology.

Jos. Schneider & Co., D-6550 Bad Kreuznach.

USA: Schneider Corp. of America, 154 Lodi Street, Hackensack, N.J. 07601.

## N-Mirotar for the Contax RTS

The N-Mirotar (n = Nacht, night) is a special lens which, through advanced technology in image intensification, makes night photography possible without the aid of artificial lighting or tripod.

The instrument comprises an high speed mirror lens, a 3-stage image intensifier tube, along with an appropriate power supply and a wide aperture macro-lens.

The mirror lens picks up residual light and throws an image of the night scene onto the photocathode of the image intensifier tube. In this tube the details of the scene are intensified 80,000 times in 3 steps according to luminance and then projected onto a screen. The macro-lens links the image intensifier to the camera and transfers the image from the screen onto the film.



In relation to a photographic lens f 1.4, the N-Mirotar magnifies the intensity of illumination on the film plane 2,500 times. This means that exposure time can be reduced through the use of N-Mirotar by 11 exposure steps.

All commercial black and white films of 20 DIN and over may be used for night photography with the N-Mirotar. It is not advisable to use colour films as the image intensifier tube does not project colours. The Contax RTS automatic exposure also functions perfectly in combination with the N-Mirotar.

On a clear moonlit night (illumination 10<sup>-1</sup> lux) with a 27 DIN film the exposure time is about 1/500 sec. Using the same type of film on a quarter moonlit (10<sup>-2</sup>) or starlit night (10<sup>-3</sup>), the exposure times are 1/60 sec. and 1/4 sec. respectively.

### N-Mirotar

Equivalent focal length: 210 mm  
Diameter of field: 30 mm  
Angular field: 8°  
Focusing range: ∞ to ca. 20 m  
Image intensifier: 3-stage  
Intensification relative to a lens f 1.4: 2,500 times greater (corresponds to 11 exposure steps)  
Power supply: 2 1.5 V baby cells (in the handle)  
Operating time on one set of batteries: 30–40 hours

Carl Zeiss, Abteilung für Photographie, 7082 Oberkochen/Württ., West Germany.

## Colour Video Cassette Recorder

JVC's lineup of video equipment has become more versatile and comprehensive with the addition of the CR-6060 E. Compatible

with any U-type video machine, it will record from live camera, off-the-air TV signals from a receiver/monitor or tuner or dub from another VTR or VCR. It can be connected to a video monitor or an ordinary TV receiver through an RF converter for playing back cassettes. The most important new feature is single-touch stop-action playback which allows you to analyze any individual picture or action regardless of its complexity. For the convenience and operational flexibility of full remote control JVC offers the optional RM-60 U Remote Control Unit.



Still pictures in playback/Pause in recording/Full remote control. Victor Company, Tokyo.

## Compact and extremely light 500-mm f 8 Minolta RF Rokkor mirror lens

This lens is a unique example of miniaturisation. It is about as long as an average 135-mm lens and in diameter looks like a 400-mm lens; its weight is a mere 700 gram! Due to the front focusing member it is possible to close in to a short 13 feet, and rendition at this range is still excellent. As in the case of all RF Rokkors, a group of lenses has been employed to correct the off-axis aberrations.



## Completely Motorized Exposure Automation

Completely motorized automatic exposure operations, comparable to that found only on a few of the finest 35 mm SLR's, is possible



with the Zenza Bronica ETR, by attaching AE Finder, Motor Drive Unit, 70 mm Film Back and Extension Eyepiece Tube.

The AE (Automatic Exposure) Finder converts the ETR to full exposure automation with the shutter system automatically controlled by the finder. Shutter speeds are automatically controlled in stageless steps from 8 sec. to 1/500 sec. for the aperture preset to the lens, based on full aperture through-the-lens exposure measurements.

The motor drive lets the user fire away at a speed of one frame per second, when attached to the mounting shoe on the base of the body, by simply keeping the shutter release depressed until the film is completely exposed.

The 70 mm film back, attached to the rear of the camera body, lets the user load a 15 ft. length of cartridge-loaded double-perforated 70 mm film for getting up to 90 exposures at a single shooting session, without changing film back and with the action automatically suspending upon the exposing all the frames.

The extension eyepiece tube provides the required extension for view-focusing through the eyepiece of the AE Finder with the 70 mm film back attached.



Manufacturer: O. Hedler, D-6251 Runkel/Lahn.

## Super-Safe 1250

Hedler has a further model to introduce to their "Super Safe" range of halogen lights for still and motion picture photography which is likely, due to its versatility, to meet the requirements of the keen amateur as well as the professional photographer.



# THE TECHNICAL PHOTO

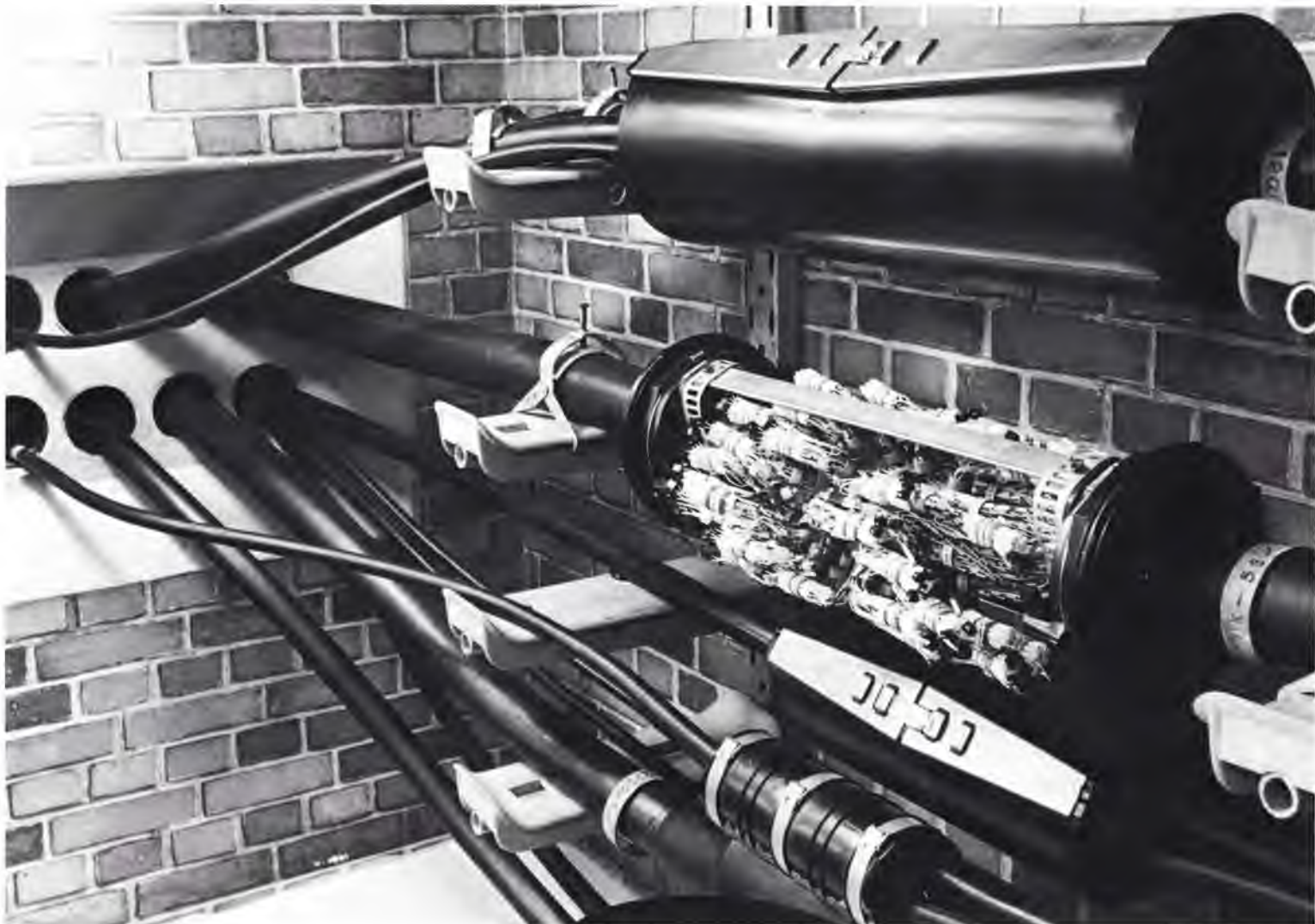
## Universal Thermoplast clamping sleeves for telephone cables

The operational reliability of local telephone lines is dependent, to a large extent, on the quality of the numerous branch-Ts and jointing sleeves which enclose the splice joints in manholes, in the earth or in aerial cables. For over a hundred years specially trained fitters had to solder the lead sheaths around the connections with an open flame. Ten years ago Siemens introduced a safe method of welding polyethylene sheaths over cables of the same plastic material. The same manufacturer has now patented Thermoplast clamping sleeves which may be easily mounted without a source of

energy and can even be opened again for inspection. Artificial ageing tests have shown that the new components have an expected service life of over 50 years.

The new Thermoplast clamping sleeves fit all manner of cables e.g. metal or plastic sheathing with or without filler, plastic or paper insulation, with or without compressed-air testing. There are five sizes of sleeve to accommodate all conventional cable diameters, and up to 2000 pairs of cable of 0.4 mm diam. may be enclosed. The robust body of the sleeve is made of non-corroding, thermoplastic polypropylene copolymer. The stainless steel

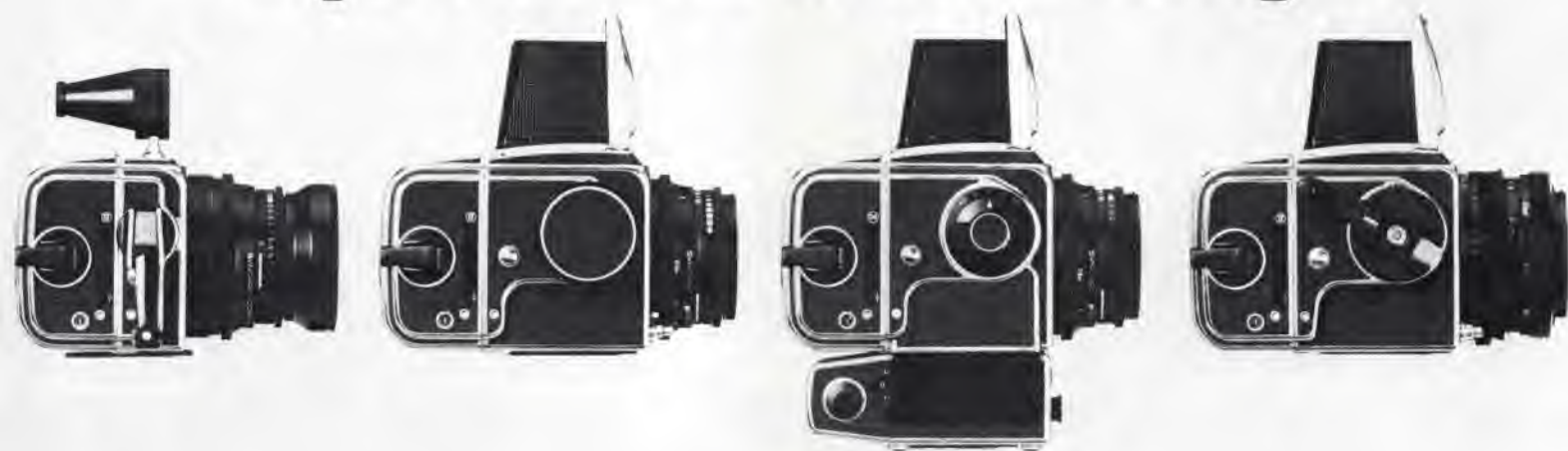
parts—consisting of clamping bands and clamping bars—hold the plastic parts together. Since the sleeves are longitudinally divided, they may also be clamped over lengths of cable in situ without cutting. An interior bracing frame of steel establishes a positive mechanical contact between cable sleeve and shield and also acts as an electrical conductor. Permanently flexible bands and cords in conjunction with specially shaped sealing joints on the sleeve form a perfect seal for the cables. Apertures for up to eight cables are then drilled by the fitter on the site at the end of each sleeve with a handtool.







# Options all the way...



The enviable reputation enjoyed by the Hasselblad  $2\frac{1}{4}$ -square camera system all over the world is mainly due to features such as versatility and superb handling. There's Hasselblad gear for almost any kind of photo job. And the advent of the new 2000FC camera now makes the Hasselblad system more unbeatable than ever.

The SWC is a special-purpose camera with a permanently attached super wide-angle lens. A unique camera of its kind. It accepts the same film backs as the 500-series cameras.

The 500C/M is the most frequently used camera model. Its camera body can be attached to your choice of film backs, screens, finders and an unsurpassed line of lenses. Not to mention a wide range of accessories.

The 500EL/M is the motorized model. Essential for coverage of fast-moving sequences and a boon in almost every kind of photography. A rugged camera built to shrug off hard use. It accepts about the same accessories as the 500C/M plus its own specialties such as radio equipment for remote control operation.

The 2000FC is an exciting newcomer to the Hasselblad system. Its electronically timed focal plane shutter has a top speed of only  $1/2000$  s, unparalleled in this format. And the electronics make all shutter speeds exceptionally accurate too. A special range of lenses has been designed for the new camera. But all the lenses (and almost all accessories) for 500-series cameras can also be used on the 2000FC.

A combination yielding options all the way ... just drop us a line for further information!



**H A S S E L B L A D**  
Victor Hasselblad Aktiebolag,  
Box 220, S-401 23 Göteborg, Sweden.



# Missile photography

The Swedish arms factory AB Bofors maintains a photographic department staffed by three photographers whose main task it is to record rapid processes as, for example, the path taken by a missile or to illustrate the impact of a projectile. The engineers and inspectors make use of a variety of high-speed cameras, i.e. motion picture cameras with a very high picture frequency and ultra-short exposure times.

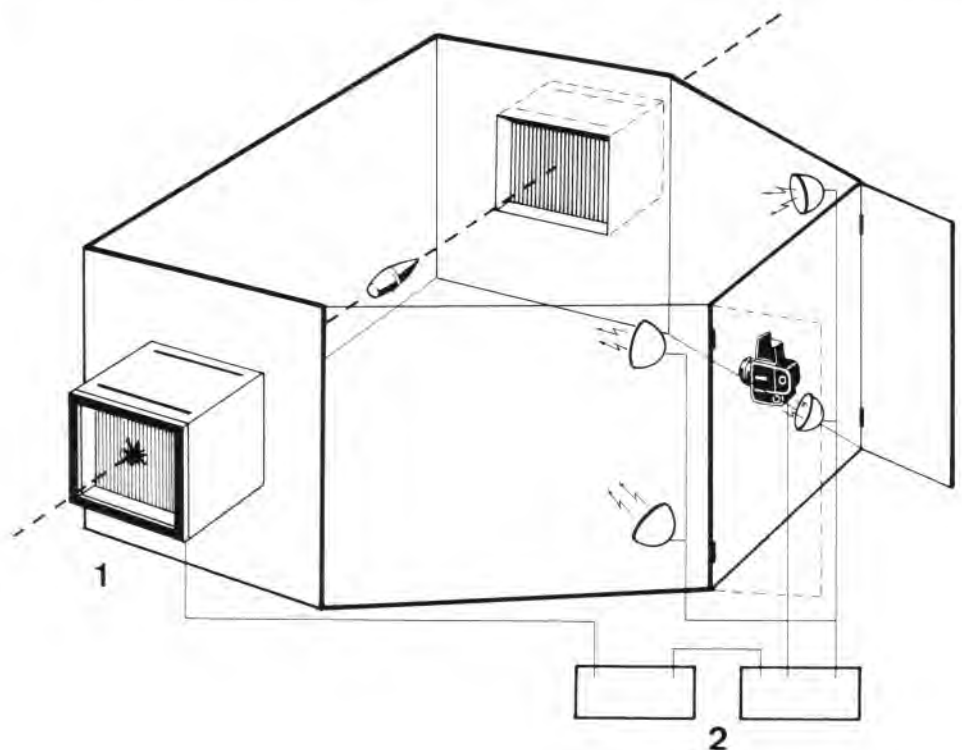
High speed cinematography, however, involves much time and material. The designers at Bofors therefore developed a still-picture system which can, in many cases, replace the motion pictures. It is perfectly possible, for example, to study the flight of a missile through the air just after it has been launched with the aid of one or two photographs. The system is based on the so-called open-flash method, i.e. the camera shutter remains open and the exposure time is determined by the electronic flash itself. The Swedish experts use electronic flash units which emit an ultra-short flash duration. The type of camera employed is the Hasselblad 500 EL which offers a number of advantages for this purpose, such as interchangeable lenses and magazines, and, above all, electric motor drive. The latter permits remote control and coupling of the cameras with units for synchronization of the gun, camera and flash. A further advantage of the Hasselblad system is the availability of a polaroid magazine for test shots in order to check, amongst other things, fine adjustment of the synchronization timing. As all photographers must know, it has to be dark for perfect open-flash photography. The electronic tubes emit a flash of only  $1/10^6$  sec. and provide sufficient light for an aperture of f 5.6 to f 8 on Tri X film. The shortest exposure time of which the shutter is capable is  $1/500$  sec. If a fast moving projectile is photographed by daylight employing such an exposure time, the daylight will flood out the flash illumination thus erasing the image of the projectile; it would, in fact, move 6 to 9 ft. during the camera exposure.

## Mobile darkroom

Bofors were therefore left with the choice of photography at night—which is more expensive—or the construction of a darkened room. The problem was solved by setting up the camera and flash unit in a dark box through which the projectile was shot. The darkened room is an aluminium box fitted with light traps (through which the projectile passes) and

shelves for the camera and flash unit. It is possible to dismantle the entire arrangement, move it to another practice ground and set it up again for further tests without any great trouble. If one wishes two exposures of the same projectile in flight, one doubles the equipment in the aluminium box and synchronizes the two systems according to the size and speed of the projectile. The projectile shown in the accompanying illustration is, how-

The exposure process is triggered by a coil as the projectile ruptures the light-trap (1). An impulse then passes via an amplifier to a time delay unit (2) which releases the flash at the moment when the projectile is opposite the camera. To exclude daylight, the traps at both ends are fitted with cardboard which is pierced by the projectile.







On test grounds the cameras must be operated by remote control. Safety precautions forbid persons to be present in danger zones during practice, but there is nothing against cameras doing the observation work.



On the Bofors test grounds it is sometimes necessary for the photographer to record the impact of a projectile at a range of 2000 ft and show the results to the engineers straight away. For this purpose he uses a 500-mm telephoto lens on a 2 $\frac{1}{4}$  square SLR and Polaroid film.

ever, an older model. Naturally, we would have preferred to show something a bit more modern, but since every detail is clearly to be seen, photos might reveal secret information.

Projectiles are not the only subject for which Bofors use the Hasselblad 500 EL

cameras. For general recording purposes on shooting grounds it is often necessary to use remote control. There are danger zones where strict safety regulations prohibit persons entering but where motorized cameras may be set up without risk to life.

### Schlieren photography

Kodak likewise draw attention to the importance of experimental photography in an article in their House Magazine, giving some examples of how it contributes to science and technology. In order to elucidate very fast processes which cannot be perceived by the human eye, one employs, amongst other methods, Schlieren photography. It can render heat and pressure waves visible in the form of streaks or striations on high-speed color film.



Record of a projectile taken with a Hasselblad 500 EL just after firing the gun. Flash exposure of one millionth of a second.  
Photos. by courtesy of Hasselblad AB, Göteborg.



# EXPERIMENTS IN PHOTO GRAPHISM

It is not wrong to state that every photograph is an image reproduced from some object or other. However we are being increasingly confronted, with pictures which do not seem to depict any recognizable subject. This probably calls to mind many a photograph from the field of science and technology, but one might equally well include graphic experiments produced by photographic means such as the original works by Moholy-Nagy, Man Ray and Hajek-Halke. Chance played an important role in these early endeavors in the field of photo graphism, since it was seldom possible for the designer to predict the exact results.

Between pure scientific photography and "light graphics" of the early period there is a transitional field in which one uses the technical apparatus in laboratories and institutes to create self-willed designs instead of the usual scientific or documentary illustrations. The difference in comparison to the old method is to be found in the fact that the new graphics are controllable and predictable and not subject to coincidence any longer. This characteristic feature is quite apparent on scrutinizing the results: the pattern consists of a self-contained, harmonious configuration, an example of what one might call "complex order". To be more precise, there are so-called "oscillograms" which were familiar to specialists in the field of mechanics before the turn of the century. The mathematical beauty of these forms were first drawn to the attention of photographers by the works of Peter Keetman and Heinrich Heidesberger. The oscillograms shown here are of electronic origin. They were created on the scope screen of a cathode-ray oscillograph. This apparatus with the rather long name can be found today in practically every laboratory which is concerned with electronic circuitry. Normally it is used for measuring purposes in connection with alternating current.

In the present instance the oscillograph is supplemented by a switching system by means of which it is possible to generate electronic alternating current in various forms (e.g. in waves, saw-tooth and rectangular patterns). The purpose of this

facility is to deflect an electronic beam in a picture tube, similar to that found in a television receiver. Likewise, the beam leaves a bright trace behind it as it scans the screen. The movement is so rapid that one perceives the entire path as a complete and stationary curve, such as can be seen in the accompanying photographs. One sits in front of a control panel with the aid of which it is possible to superimpose the various forms of current on the screen, building up an experimental pattern until such time as it appears most attractive to the eye. Photographing the final design is no problem at all: one sets up the camera on a tripod in front of the display screen and records the configuration with the exposure time indicated by a conventional exposure meter. In the case of the present examples the times were ten to twenty seconds. There are, in fact, special films for recording oscillograph images, but in view of the increased brightness of the latest screens it is perfectly possible to achieve satisfactory results with moderately high-speed film.

One of the accompanying photographs came about in a completely different way and yet on comparing it with the other "electronic graphics" it is hard to tell the different origin. It is a matter of a coiled roll of plastic, placed against a dark background and illuminated from only one side. Due to its natural elasticity it forms harmonically smooth curves, especially when twisted. The reason for the similarity is the mathematical concept of "continuity" which plays just as important a role in the law of elasticity as in electronics.

There is no doubt that such pictures take us outside the realms of photography with normal means. They do show, however, that the creative scope which lies within the photographer's grasp is by no means exhausted. A judicious combination of modern scientific means, appropriate camera equipment and special films opens up a wonderland of fantastic forms. They may find commercial application in the fields of fabric or wallpaper design or justify their existence merely as aesthetic works in their own right.

*Dr. H. W. Franke*



The "oscillograms" shown here were produced electronically on the display screen of a cathode-ray oscillograph. Photos: Dr. Herbert W. Franke, Puppling.





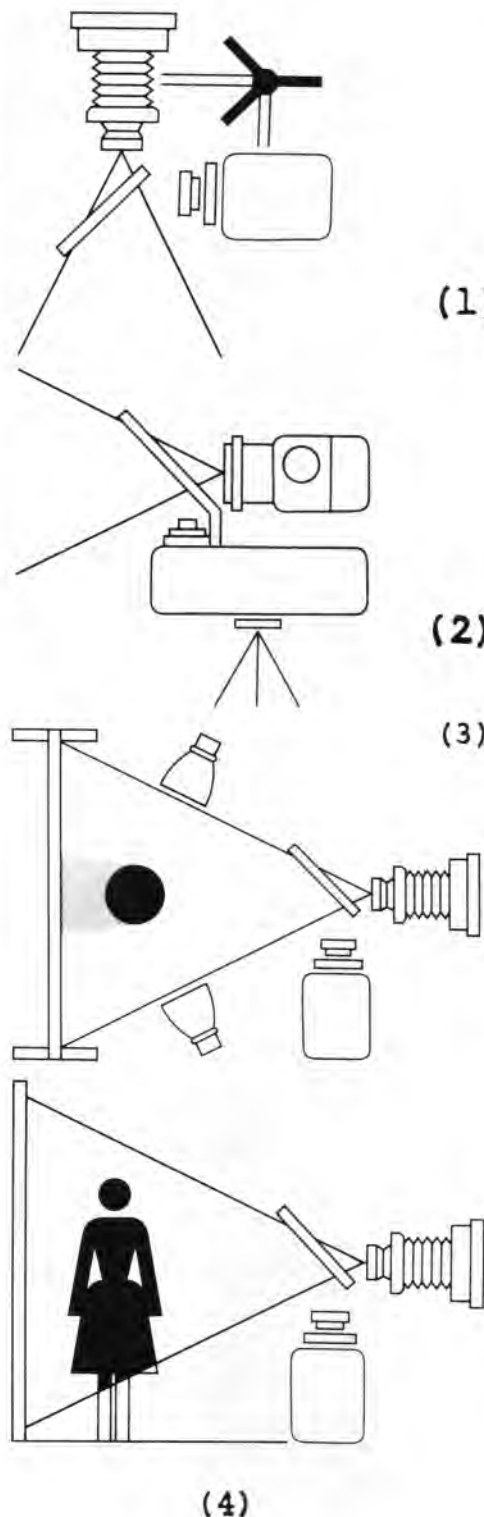
# Background projection

The design of the background has played an important role ever since the invention of photography. A projected background was merely a logical development of this need. In actual fact there are two ways of projecting an image onto the background: from the front as well as from the back. It is the former which receives attention in this contribution. According to the kind of assignment, and the camera format in question there three systems on the European market at present:

1. Nordic Frontpro HCS for 35-mm and medium-format SLR cameras.
2. Broncolor Miniflex for cameras up to  $2\frac{1}{4} \times 2\frac{1}{4}$  in. ( $6 \times 7$  cm) and Combiflex Model for cameras up to  $5 \times 7$  in.
3. Hensel Frontpro-Equipment.

On of these, or a similar systems, is regarded as standard equipment for a commercial studio nowadays, especially where fashion or advertising assignments are carried out. In the first place it is the independence from the weather and short deadlines which are decisive for the acquisition of such equipment. However it is also the creative aspects, where one does not attempt to conceal the use of projection, which are equally convincing. It is the possibility to abstract which attracts creative fashion photographers such as Mark A. Mender.

One must pay careful attention to correct harmony of the lighting sources. That is to say, the light falling on the model and that on the background must be balanced. Professionals use all manner of tricks for their own personal lighting effects. Illusions are conjured up by means of mirrors, incident light, panes of glass, etc. Especially in the field of advertising and fashion it is important to constantly offer the public something new. And this is where the creative photographer comes in. The following description of the integral type of front projection is based on the Broncolor unit.



## Integral front projection

A. Nüssli

Mail order houses as well as most enterprises in the clothing industry have been compelled by the current economic situation to keep down the cost of their printed publicity material. This means that advertising budgets can seldom cover any ambitious journeys with a large team to far-off countries. In their endeavors to still try and stage their fashion publicity against an exotic background, satisfy the consumers wish for vacation atmosphere and bathing beaches and yet forego such trips, the manufacturers have once again turned to the medium of front projection. Thus this technique—which is by no means new—has been injected with fresh life. In response, Broncolor have brought out two new models: Miniflex for cameras up to  $2\frac{1}{4} \times 2\frac{1}{4}$  in. and Combiflex for larger cameras up to  $8 \times 10$  in. Both models work on the principle of semi-reflecting mirrors and highly-directive screen as illustrated in fig. 3. In the case of the Combiflex, the projector (and hence the projection axis) is arranged at  $90^\circ$  to the side of the camera. The projector for the Miniflex, on the other hand, is mounted directly below the camera (fig. 2). These different arrangements do not affect the basic projection principle, however. The image thrown by the projector is reflected from the highly-directive screen back along practically the same axis and into the finder focusing screen via the mirror of the camera. The object (model, etc.) placed in front of the screen does, indeed, reflect the projector light as well but with such a reduced intensity (in comparison to the HD screen) that the film no longer registers this.

The reflective properties of the beaded screen can be compared to those we are familiar with in traffic signs which are capable of reflecting much more light than a white surface. The integral method incorporates a "floor screen", which has greatly increased the scope and reality of the projected background as we know it (see fig. 4). With the aid of these patented "floor screens" the scenery is reflected not





The Broncolor plant as described in the main text



In the case of the Nordic Frontpro HCS a suitable slide is projected onto the background. The brilliant image is diverted from below via a semi-transparent mirror onto the background, whereas the camera can still photograph through the mirror. The mirror combines both viewing angles so that the background projection seems to come "out of the camera". The shadow which the model throws against the screen is not visible to the camera, since the figure covers it up exactly. The HCS highly-directive beaded screen reflects the projected light back along more or less the same path through the Frontpro mirror into the camera. On account of the highly directive characteristics of the HCS screen the projected image appears 400X brighter than on a conventional screen. The light issuing from the projector is therefore not so bright that it can make much impression on the clothing of the model. The result is that the camera "sees" the model and background as one integral picture.

only from the back but also from the ground on which the model is standing, i.e. the entire figure is fully integrated in the environment. This does away with the problem of "cut-off legs", always a tell-tale sign of the conventional projection system (fig. 5). The necessary aluminium floor boards are coated with highly reflective material and measure 11 x 23 in. They are mounted on a suitable prop in front of the background screen and, according to the effect desired and the prevailing taking conditions, may be lined up together to form a sufficiently large platform (fig. 6). Assuming certain conditions such as appropriate lighting from the right direction, choice of color slide, use of polarizing filters, etc., it is perfectly possible to take pictures in a studio which hardly betray the fact that they were not taken out of doors on location. A much more interesting application is to be found in the possibility to manipulate the motif in a variety of ways.

In the case of photos including the ground or flooring it is necessary to use a polarizing filter in front of each lighting source and the camera lens. The polarizing filters prevent the loss of contrast on the floor and back screens. The slide for projection may have to be specially prepared, taking certain criteria into account. The foreground should have a conventional "walking space", such as a sidewalk, flag stones, sand, carpet, etc. The subject is

then placed on this area. A meadow or water surface is less suitable. The lighting in the transparency should be of such a nature that it is easy to simulate in the studio. To maintain harmony of perspective and proportions between studio and location shots, one should remember to use lenses of appropriate focal length for the format in question. Both projectors are available with a variety of interchangeable lenses.



The Hensel front projection system in conjunction with the Linhof Kardan Super Color. Below one can see the projection unit and above the latter is the projection lens. In front of the lens one can recognize the semi-reflecting mirror in the form of a trapezoid. On the back of the camera is the rapid-change slide with connection running to the automatic shutter. The subject is viewed from above via a right-angle mirror attachment, then the filmholder is slid into position automatically closing the shutter leaves and stopping the diaphragm down to the working aperture. The shutter may then be released (without cocking) and the carriage pushed over again for a further look at the model. The whole procedure takes about two seconds.

#### Color page right:

The photos 1, 3, 5 and 7 were taken by the well-known Munich photographer Mark A. Mender. For him front projection is not an emergency solution but represents a creative means. Photos 2 and 7 are the work of Jacques Schumacher, Hamburg, who has also made a name for himself in the fashion world. Picture No. 4 was put at our disposal by the electronic Manufacturer Bron AG, Allschwil, Switzerland.





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by Dr. Herbert W. Franke

## Speleology with the camera

*Color page left*

*Top left:*

This particularly interesting atmosphere was created by releasing the flash in the direction of the camera from behind a stalactite in a cave with a subterranean river.

Photo: Tonino Pecora, Italy.

*Top right:*

This mighty stalactite was photographed by Dr. Herbert W. Franke, Puppling, in the Krasnohorská cave massif, Czechoslovakia.

*Extreme left, center:*

A photograph taken by Walter Imber in the "Hölloch" catacombs, Switzerland, the second largest cave system in the world.

*Center:*

Two speleologists in full diving equipment who are just about to explore the secrets of the subterranean wonderland.  
Photo: T. Pecora, Italy.

*Extreme right, center:*

This photo of an artistically formed structure was also photographed by Walter Imber in the "Hölloch".

*Bottom left:*

Surveying by a member of the expedition.

*Bottom center:*

This is a very well-illuminated shot of the so-called "Water Cathedral" in the "Hölloch" system in Switzerland.  
Photo: W. Imber, Switzerland.

*Bottom right:*

For really ambitious tours, the participants will not only need frogman's gear but also at least one inflatable rubber boat.  
Photo: Tonino Pecora, Italy.

The fascinating underworld of caves is one of those regions which is accessible to only a few. The kind of "show cave" where the public may wander casually along marked ways illuminated by artificial light is, of course, an exception. The charm of the subterranean rock landscape with all its attractions and dangers is then lost as far as the genuine speleologist is concerned. Real experience of this kind is only to be found in unknown or only partly explored caves. There are still plenty of them in some countries of the world and a few have not even been discovered as yet.

Anyone who considers venturing into such unknown caves must be properly equipped, and that means warm clothing, climbing boots, helmet, lamps, lines and rope ladders. Some cave systems are so vast that several days are needed before one arrives at the point last explored and where unknown territory begins. Under such conditions one also needs sleeping bags, inflatable mattresses, food and a cooking stove. In addition there will be all those items of equipment which are required for scientific evaluation of the caves, such as measuring instruments, thermometer, etc., and here the camera occupies an important place.

The subterranean wilderness is not only of interest from a scientific point of view; it can prove to be unexpectedly beautiful. The stalactites and stalagmites of huge proportions, the bizarre forms of the ice, hollowed out rock formations and the richness of the colors all of which one very seldom sees on the surface of the earth. Then, of course, there are those intangible impressions which are difficult to describe and certainly impossible to photograph, although some have tried to interpret their impressions into photographic terms: the

loneliness of this silent world, the apparent lack of the passage of time, the yawning emptiness and, a paradox for the photographer, the darkness which he only manages to interrupt inadequately and only for a brief moment.

The camera is therefore not merely a scientific recording instrument but helps us to capture a fleeting moment in the bowels of the earth, to give us, with the aid of flash, an overall view of large caverns which it is impossible to illuminate with the regrettably weak carbide lamps, to record man's struggle with the dangers of loose cave walls, subterranean rivers, deep abysses and narrow crevices which one has to crawl through.

One takes a camera along although it is well known that the likelihood of it being damaged by bumps or high humidity is great. Mishaps of one sort or another are the order of the day. This is one reason why speleological photographers discuss camera equipment from a different viewpoint than others. They are interested to find out whether a particular camera is robust or less reliable, whether one can still discern the focusing point by the light of a carbide lamp or not and whether it is possible to change a film with slippery hands as one is crouching on a narrow ledge above a precipice with nowhere to lay anything down.

There are other restricting factors which determine how much photographic equipment a participant in an expedition may take along since, after all, everything has to be carried on one's own back and vital supplies take priority. When branching off into unknown territory one is therefore most likely to take along a fairly small camera and minimum accessories. This is the reason why few photos of caves have ever been taken on medium



format film, not to mention even larger formats. A further explanation is that photography under such difficult conditions calls for much more time: many of the existing shots were taken hastily during a rest period as the party advanced. If one is really keen to take a series of high quality, one must return with a self-organized photographic expedition.

### **Lighting technique—the Alpha and Omega**

The big handicap in photographing caves is, not surprisingly, the absolute darkness, which it is difficult to overcome even with artificial means. Lighting thus becomes an issue of even greater importance than the type of camera or other accessories. The flash powder of early days had the advantage that one could measure out the correct, generous dose. On the other hand it created clouds of smoke and haze, which soon put an end to photography. Today's conventional flash bulbs or cubes are quite good for smaller sections of the cave or for lighting the activities of a single person.

What is usually desired, however, is a survey of the scene, an overall view of the extent of a large chamber. It is only possible to cope with tasks of this nature with the aid of powerful reporter-type flash units. Since a single electronic burst is seldom enough to illuminate the entire scene, experienced cave photographers have developed a clever method: the camera is placed on a tripod and the shutter left open; the "lighting man" wanders around scanning the relevant part of the cave with the flash unit, releasing several flashes in a row. Alternatively, a number of flashes may be added up (cumulative flash) to reach the required intensity. The lighting is more effective and generally satisfactory when one side is illuminated more strongly and merely a fill-in light set at the front or from the opposite side. Only in this way can one retain the impression of depth in the cave formation. Unfortunately one has to rely on estimation and experience in this lighting technique. It is not at all necessary to illuminate every corner of the cave; the "genuine feeling" of a cave is more likely to be reproduced by leaving receding corridors or crevices to vanish into the gloom.

### **An important accessory—the human being**

The "lighting man" will be obliged to clamber around the perimeter of the view taken in by the camera, usually only with a

pocket lamp to guide his way. It is difficult to shoot action shots under these "multi-flash" conditions, because the person involved will have to stay fixed for the entire lighting procedure. Nevertheless it is recommended to light a figure or other familiar object with an isolated flash so as to give the scene some comparative scale. It is otherwise difficult to tell the size of a stalactite without some kind of measure. Sometimes pictures have appeared in magazines inverted top to bottom.

In spite of the effectiveness of the multi-flash method it is still worth while employing an electronic flash unit of maximum output, since the capacity of a small unit (at full power) is exhausted



Stalactite formation in the Oxocelhaya Caves in the French Pyrenees.  
Photo: Dr. H. W. Franke, Puppling.

much too quickly. The unit should also be mechanically robust and the electronic circuitry absolutely reliable in view of the probable 95 to 100% saturation of the atmosphere.

### **Which is the best kind of camera?**

There is still some discord on the subject of which camera to take along on a cave expedition. Of course, there is much to be said in favor of fast lenses and bright viewfinders but, as mentioned, weight and volume of the camera cannot be ignored. The decision whether to take an expensive, top-brand camera on such an arduous undertaking, as it is, must remain

a personal one. For difficult descents into unexplored caves I prefer to take a Contarex with 50-mm f 2.8 Tessar, as well as 25-mm f 2.8 Distagon and 135-mm f 4 Sonnar. It is especially the wide-angle Distagon which enables me to still take in a broad field under cramped quarters. On expeditions with a definite photographic nature I have also had good experience with various 2¼ square cameras, e.g. an IkoFlex.

The pictures of caves which are seen in certain photographic magazines have rarely been taken in virgin caves. Close examination of the photo will usually reveal a lighting cable, railing or concrete steps. Photography in so-called "show caves" is much less problematical. Here one has electric light by which to focus, a flat concrete path on which to settle the tripod and then all that is required is a series of flashes for a more effective lighting. But the genuine speleologist is left unsatisfied by this kind of picture taking. His ambition requires that he shoots good pictures even in the most difficult terrain which show something different than the postcard view from the tourists' pathway. The photographs must at least convey a faint impression of the atmosphere which confronts the intruder in such a strange world; here he is entirely dependent on his own wits, a human cut off from his own kin in a labyrinth of dark passages which lead ... who knows where.





# TECHNORAMA IN CHINA









# TECHNORAMA IN CHINA

There Sekal had originally wanted to work with a 6×7 camera as well as the Technorama, but the former went on strike so he was obliged to use the Technorama for the rest of the tour. He was then glad about the reasonable size and weight of the camera in comparison to the super format. Even after he had damaged the camera in a fall, he managed to go on using it without detriment to picture quality—pretty tough!

The photos published here show the typical characteristics of the camera in practice—the Technorama is a special camera constructed for wide-angle pictures on conventional roll film.

## A glance behind the Bamboo Curtain

Perhaps the reader ought to remember that the photos shown here are, in actual fact, sharper and much more brilliant than in print. Journeys to the People's Republic of China are not quite as unattainable as in previous decades, but it is still difficult to overcome the so-called "Bamboo Curtain". Information from the world's most populous State is not quite as thin as it used to be. Yet this great country still remains an enigma, a land full of mysteries in the eyes of the Western World and difficult to comprehend for western mentality. This is the reason why such photos are of immense informative value. They may not quite come up to the superb standard we normally insist upon when selecting a series for this magazine, but their documentary value alone justifies publication.

A photo of Chinese tourists walking along the Great Wall of China shows them and their children wearing fairly modern clothing. Although these people were probably from the better-off class of the Chinese population, the photo does seem to contradict the cliché impression we all have of the Chinese going about their

work clad in Mao-inspired blue overalls.

Josef Sekal occupied himself with large-format and panorama cameras right from the beginning of his career. He was born in Prague in 1936 and after leaving high school went on to study photography; he was one of the very few photographers to work with large view cameras in Czechoslovakia in the 1950s. At that time the trend was towards 35 mm or, at the most, the 2¼ square format. Sekal was, moreover, a pupil and friend of the well-known photographer Vilém Heckel who died on an expedition in Peru as the result of a natural catastrophe.

Sekal is chiefly occupied with calendar photography and publicity for the Czech tourist authorities. He won a major prize in a competition run by Grossbild-Verlag in 1965. His field of operations takes in most of the East-European countries, but in the meantime he is also known in professional circles in the West as well. For 15 years now he has worked with Linhof cameras from 2¼×3¼ in. up to 8×10 in.

## An urgent requirement is met

In the early days Sekal tried to solve the panorama problem by using a 5×7 in. Technika, a 90-mm wide-angle lens and half a sheet of 5×7 in. film. Shortly after the Technorama went into production, Sekal received one of the first models to put it through its paces. It arrived just as he was about to depart on a journey to Vietnam and Mongolia and so he had no opportunity to test it initially. Yet the pictures he brought back from the trip were most successful. Sekal said he is delighted with the modest weight of the panorama camera and the fact that one can use normal roll film, obtainable the world over. This is rather an important point, when one comes to think of it, for a photographer who travels to diverse countries around the globe.

Although introduced to the market only about a year ago, Linhof's completely new Technorama camera has already a most impressive collection of pictures to its credit.

Practically every day the Editor receives photos from Germany and abroad which have been taken with this ultra-wide-format camera. The extended scope or, to be more literal, perspective inherent in this camera is immediately apparent from the photographs. This is true of the technical pictures as well as the landscapes.

On several occasions we have already shown our readers what one can do with this super-wide format. A particularly charming series was to be seen at last year's Photokina taken by the Czechoslovakian landscape and art photographer Josef Sekal who had been invited to exhibit pictures from his last visit to Eastern Asia. It was particularly the collection shot in China which aroused great interest.



A "total" photograph embracing 360° or even more is now possible with a camera developed by the Zurich manufacturer Arca Swiss. The outstanding feature of the "Rotocamera" as it is called is that there is no longer any limitation to the field of view: it enables one to take, without any difficulty, photographs of round, long and high objects, the actual picture section being decided upon afterwards.  
Photo: Arca Swiss.



# THE PICTURE LANGUAGE OF TECHNOLOGY

There are many books and articles which endeavor to compare photos of scientific origin with more conventional works of art. The similarity is, indeed, sometimes amazing, and this seems to be justification enough for certain critics to claim that photography *can* be art. In reality, the support of such a comparison is not essential; the designs and configurations produced by technical means do not first require comparison with conventional fine art in order to survive. Understandably, like all photographic processes, they are also mere reproductions of reality. The point to note, however, is that this is not realized by every viewer. Those who are versed in scientific and technical matters may recognize the object depicted. Others will merely perceive an interesting impression of abstract patterns and forms. Such a manner of viewing can lead to completely new visual experiences. To recognize the formal beauty of the pictures, one obviously requires to forget about their association with some real object or other.

## Organic materials forming crystals

The best known kind of picture with a scientific origin is that from the field of photomicrography. The snow crystal, for example, is popular as a means of demonstrating structural harmony, and it is astonishing to learn that, in spite of them being subject to the same natural laws, no two snow crystals are exactly alike. Crystalline forms are to be found in many other spheres of nature, e.g., mineralogy and metallurgy. It is less well known that organic materials are also capable of forming crystals; the two illustrations of "salol" (phenyl salycitate) are evidence of this.

Whereas photos within the above range can be perceived by the human eye when aided with a magnifying glass, many biological specimens take us into a world of completely unknown configurations and patterns. Photos produced with



*Bottom:*

Super 8 film for IC mounting: the approx.  $1.6 \times 2$  mm chips are fixed in the projection apertures of a polyamide tape which is coated with copper, then tin-plated and finally etched in such a manner that the conductors and connecting terminals are created. Photos by courtesy of Siemens.  
Snow crystal: no two are quite alike.



In this new integrated circuit generation, the semiconductor chips are mounted in the projection apertures of Super 8 film. It is possible to accommodate about 1000 integrated circuits in one meter (3.28 ft) of film.

the electron microscope are examples of this. It is a technical and practical application of a discovery which inaugurated the modern era of physics: the fact that there is no practical difference between particle waves (De Broglie) and wave radiation. Showers of rapidly moving electrons possess wave character and are analogous to those of light. It is therefore understandable that one came upon the idea of using electron beams for image-recording purposes, and since the electron beams are "finer" than light waves it was proved possible to penetrate much further into the microscopic world—almost as far as the order of magnitude of the atom!

## New microscopic shapes

A sensation a few years ago was the invention of the scanning electron microscope. Scientists had calculated that in micro-miniature photography there was no depth of field anymore, i.e., only a single plane could be rendered sharp. This theory was made obsolete by the SEM in which a completely new principle was employed. The conventional manner of seeing like the eye or the microscope was abandoned and replaced by a principle which might be described as a "blind man's stick". An electron beam was, it is true, used again, but it was employed in a completely different fashion: the object was scanned point after point and line by line and since one can fade out an electronic beam finely over a space of several centimeters as desired, there is also no unsharpness within the corresponding distance from the electron source. The third dimension was thus within the reach of the micro-specialist. This is not only excit-



ing for the scientist who can now inspect his objects in a plastic, spatial mode but also for those who are fascinated by the newly discovered, bizarre world of microscopic shapes.

Scientists also maintained that it was not possible to photograph atoms. In the meantime even this supposition has been shown to be faulty. At least we now have excellent means of recording the paths along which the atoms race. They are to be found in the labs of the nuclear physicist in the form of the Wilson cloud chamber, arc chute and bubble chamber. The methods applied in each case are based on the principle that the particles racing around are induced to leave traces in certain gases or liquids (e.g., in the Wilson chamber, cloud tracks). Such phenomena are most impressive, even for the non-physicist; he may not understand exactly what is happening, but it is nevertheless part of the reality in which we live.

**The circle has closed**

The picture of the astronaut appears almost conventional in comparison; one might think it is a straightforward photograph printed through a half-tone screen. However this photo, which shows the Soviet astronaut Titov as he orbited the earth in a space capsule, also documents man's efforts to overcome the barriers imposed by nature. It was broken down into electric impulses, transmitted to the earth by radio and converted into a picture again. Thus, one might say, the circle has closed: it started in the microcosm and now comes together again in the infinite remoteness of the cosmos.

*Dr. H. W. Franke*



Above and top right:  
Even organic substances can form crystals as can be seen in these two photographs of "salol".  
The grooves of a gramophone disc as seen under an electron microscope.  
The Soviet cosmonaut Titov in his space capsule.





# The new Zenza Bronica EC-TL

Anyone who gives the slightest thought to the design of a single-lens reflex camera with interchangeable magazine today will find it very hard indeed to deviate from the "classical" concept of a box with several sides for the attachment of the necessary interchangeable parts. This basic arrangement is just as space-saving and imperative as the likewise "classical" bellows on any view camera. These geometric data—which determine the square shape of the format in the case of cubic cameras likewise for economic reasons—settle the format problem almost from the very outset. The arguments against the  $2\frac{1}{4}$  square format are well known; the merits of the system, which derive from the optimum utilization of lens coverage, are apparently too often forgotten. Economy, however, is taken not only as the restriction of the aspect ratio to more or less suit a moderately rectangular enlargement but also as an attempt to make the most, information-wise, of film formats which will fit into a square frame. After all, we still have the freedom to fit the magazine which

has the most appropriately-shaped format. There is nothing particularly new about this economical design principle and it has also stood the test of time.

What is new in the case of the Zenza Bronica EC-TL is the lag-free TTL exposure metering system and fully electronically controlled shutter (silicon blue cells) incorporated in a medium-format camera which is aimed at satisfying the needs of professional users. More about the outstanding reliability of the exposure system follows later. In addition, there are a number of interesting mechanical features which make this camera a pleasure to work with. Generally, one might say that it is an extremely adaptable "system" camera with interchangeable magazines, interchangeable viewfinder hoods and a splendid array of lenses from ultra-wide-angle to telephoto lenses of 1200 mm focal length which leaves (almost) nothing to be desired. It is comforting to know that the previously available range of accessories is going to fit the new model and function properly.

One point of especial convenience is the ease with which the magazine can be removed and replaced. It is impossible to make an error here, since only when one has pushed home the slide is it possible to detach the magazine from the back. Also worthy of praise is the simple manner of switching over from 120 to 220 film without the need to exchange pressure plates, as well as the fact that one can see all settings, such as aperture and shutter speed, from above—even the frame number and type of film loaded. Since all operations may be carried out with the right hand, the left hand is always free to hold the camera as desired.

Finally, attention should be drawn to the integrated, electronically-controlled shutter and the two-section, instant-return mirror which have been taken over from previous models of the camera. The division of the mirror into two parts was, in the first place, the designers solution for a more compact camera but it does also permit the use of extremely-long-focal-length lenses without the irritating dark strip on the mirror. This is an advantage seldom to be found even in the luxury-price category. Further, the more effective damping of vibration inherent in this design reduces the risk of mirror-slap spoiling sharpness at slower speeds.

## The most important feature—the fully automatic exposure control

The vertical-run focal-plane shutter reacts, via a silicon photocell, to the amount of light passed. The shutter/aperture ratio is thus influenced according to the so-called "aperture-priority principle". This is only of formal importance, however, since it is equally possible to decide on a particular shutter speed. It is a known fact that in the case of "shutter-priority" systems, mechanical transmission elements must be available between the housing and the lens, and this, in turn, implies that lenses already on hand will become obsolete.

The manufacturers of "universal system" cameras are in a much more difficult position when it comes to



Left:

The  $2\frac{1}{4}\times 2\frac{1}{4}$  in. Zenza Bronica is supplied with the standard lens 75-mm f 2.8 Nikkor and the specification includes, amongst other things, electronically controlled focal plane shutter, automatic and manual exposure metering, rapid-return mirror, interchangeable magazines for 120 or 220 roll film, Polaroid film holder, etc. There is a choice of interchangeable lenses from 40 to 1200 mm. Dimensions: 139 x 117 x 170 mm; weight 1840 gram without lens.



carrying through radical changes than those who cater for a smaller, more flexible and easily identifiable clientele. The designers worked out a compromise which paid due consideration to all these factors, and one can say that they were, taken all round, very successful. The solution found permits one, in the first instance, to use all the lenses from previous models of the Bronica and, secondly, determine exposure data with speed and accuracy, taking into consideration all the requirements imposed on a professional, such as narrow selective measurement and storage of important details anywhere within the image area, aperture differences, lens and filter characteristics and contrast measurement. The system also incorporates optional override control and guaranteed exact timing of long exposures. It does not take long before one has become thoroughly familiar with the operation of this well-balanced camera.

### A word on the camera in practice

How to influence the exposure metering system on "Auto": Having decided on the picture section and focused, the depth-of-field pre-view button is pressed (on the left below the lens) whereupon an LED display lights up, indicating the shutter speed which would be automatically selected under the given lighting conditions. Should this speed seem unsuitable, it is still perfectly possible to adjust the aperture ring. On releasing the shutter, the indicated speed is "free" and no longer binding. In the case of an average subject with a moderate range of contrast, this method always brings reliable results. Should the contrast be high, on the other hand, one must resort to the well-known rules of the spot-measurement game. In view of the logical, simple procedure in operating the metering system, they should cause little trouble. A bright, not-too-small portion of the motif, and one which is important to the picture, is first picked out and measured. The computed shutter speed for a pre-selected f/number is then read off the LED display panel and transferred to the shutter-speed knob. Finally, the camera is swung back to take in the desired and previously-framed part of the scene. All that remains is to release the shutter. To go one stage further, and take a contrast range measurement, it is necessary to read off a spot measurement

from vital light and dark portions of the subject (with the camera set to "Auto") and set the mean value of the two readings manually. In fact, the whole affair is carried out much quicker than it takes to read these lines, since changing over from "A" to "M" and dialing in the desired speed are all executed on one and the same shutter speed selector knob, and all values are visible from above. In spite of the apparently complicated procedure, this method is likely to bring a higher percentage of successful shots in the exacting photography of high-contrast subjects than the even more sophisticated center-weighted systems to be found on some 35-mm cameras. The latter system is, of course, better in the hit-or-miss type of action photography. It is of little use, however, when faced with photographing a church window, a forest interior or similar scenes.

Should the batteries ever let you down, it is nice to know that the shutter will still operate at the statistically average speed of  $1/40$  sec.

At the beginning it was mentioned that economic thinking played a major role in the design of this camera. This basic idea has been pursued throughout the entire system, for example, in the construction of the lenses. The focal lengths from 40 to 200 mm are not fitted with helical mounts of their own. This saves weight and expenditure. For this series there is, instead, a universal focusing mount with bayonet for attaching to the housing. The teles from 300 mm and longer possess, on account of the greatly differing extension, either an integral focusing movement or require a separate focusing unit. Now that is a clever solution.

A small bellows unit can likewise be attached to the housing instead of the universal helical mount. It has sufficient scope to get you down to a copying ratio of 1:1. For special purposes there is also a larger version with all the perspective controls common to a view camera: Scheimpflug, lateral shift and swings to the side. And that is a good division of labour.

In view of the  $1/60$ -second synchronization for electronic flash there is unlikely to much demand for a special lens with integral leaf shutter. But it is there for the asking. Perhaps this is half the answer to the practicability of large focal-plane shutters. The other half is only to be found in a lengthy test of their reliability. Here the owners of older Bronica cameras should be given

a chance to air their views. Little negative criticism has been heard so far.

Since there is no product in the whole world which leaves absolutely nothing to be desired, here is a short list of personal wishes and suggestions for improvement:

It is hard to believe that not a single  $2\frac{1}{4}$  square SLR manufacturer has considered it worthwhile to include a shift lens in his program.

It is almost as if the manufacturers of large-format view cameras have organized a lobby to keep these newcomers out of their ranks, hence out of architectural photography.

If Bronica were to introduce one or possible two wide-angle lenses which permit a reasonable amount of lateral shift, that would be a great help. When one examines the large mirror of the Bronica, it is hard to imagine that this is not technically possible. Any  $2\frac{1}{4}$  square SLR system with interchangeable magazine which can boast such a shift lens has already taken a lead over its competitors.

The fact that there is no motor-drive in the program is unlikely to irritate all that many photographers. Others have got so used to this mode of working that they regard the system camera par excellence as one possessing motor-drive plus automatic metering. The option is not there for Bronica fans, and that is rather a pity.

The range of accessories also lacks a suitable choice of macro/micro lenses. This gap ought to be filled.

Though the following shortcomings might be regarded as merely superficial, they do deserve mentioning:

It is annoying that the cover slide can no longer be placed in its "pouch" or withdrawn again when the prismatic viewfinder C is in use. The frame number is rather difficult to read. Such gripes, which are not particularly difficult to remedy, should not detract from the positive overall impression the camera leaves on the user.

To sum up, it was the correct decision on the part of the designers as to what is really essential and what is less important in a camera of this type that is worth underlining again. There is no padding, no technical gimmicks inspired solely by fashionable trends. In the eyes of some, the camera may lack glamour, but it is an instrument which will appeal, above all, to the professional who must see a return for every cent invested. It is a camera which is just right for our times.

H. Bortsch



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**Unterwasseraufnahmen im Großformat**

**Large-format underwater photography**

**Photographie sous-marine en grand format**









# Large-format underwater photography

The reader is bound to have noticed that developments in underwater photography have experienced a boom in the last year or so. At first, the market was very small and the fees too meager to make it worth while. As greater depths of the ocean were explored, the demand for submarine photographic know-how grew apace. Today this branch of applied photography has left the infancy stage far behind, and we encounter a much higher standard as the result of new techniques. Ten years ago underwater camera housings were mostly custom built; today it is not unusual for camera manufacturers to offer a series production housing from stock.

If one leaves 35-mm photography aside and goes straight to the larger formats, one will find that for quite a variety of medium-format cameras there are appropriate housings. But the choice ends at 6×7 cm. On account of the great inconvenience when changing sheet film holders—one must come up to the surface—it is not surprising that preference has been given to cameras with 220-film magazines (or 70-mm magazine for the Hasselblad).

I was not able to find out anything about the feasibility of using a sheet-film technical camera underwater, so took up the matter as a challenge. A whole host of problems was waiting to be solved. Before tackling the camera operation itself, there was the difficulty of obtaining sufficient illumination for this large format. I did, however, already possess experience with slave cells underwater. After a series of experiments I found it was possible to remotely trigger powerful home-made flash units from the camera. (At that time there was nothing suitable on the market.) These had an output of 130 watt/sec. each and a capacity of 150 flashes per charge. Even these had to be replaced later by 600 watt/sec. units, be-

cause at a range of over 13 feet the water filtered out the red component of the light. With the more powerful units—which required a housing of only slightly larger dimensions—it was not only possible to eliminate the green cast within the 13-ft range but a smaller aperture could also be selected and hence greater depth of field obtained.

## The underwater large-format camera

The greatest problem was to *make* an underwater camera for sheet film. The idea of enclosing a normal 5×7 in. view camera in an extra housing had to be



abandoned, because the whole contraption would have been much too large and heavy to handle. Also the plan to incorporate a device to change the film holders had to be dropped, since this would all have been too complicated, bulky and subject to disturbances. I therefore had to settle for a one-shot job. The bellows and film-holder back of my own design were built into a light plastic tube. The only feasible lens was a genuine wide-angle one in order to convey a genuine three-dimensional impression and obtain sufficient depth of field. It turned out to be a Grandagon from Rodenstock. The use of a flat "window" on the front of the housing was out of the question on account of the 150°-angle-of-view of the lens. The latter would have been greatly reduced by the refraction of a plane glass sheet and optical distortion would also have occurred towards the edges of the field. In addition, the refraction of the water also introduces a discrepancy in focusing, shortening the actual distance to be set. In practice this means that the nominal focal

length selected turns out to be longer underwater than one expected and is hence accompanied by a decrease in the depth of field.

## Plastic dome as front lens

After a lengthy search the solution proved to be a semi-sphere made of plastic. A dome more or less retains the original angle of view of the camera lens and, due to the fact that it does not need to be so thick, it avoids the introduction of further optical errors. Unfortunately, these domes are only available in Perspex, and one therefore has to be careful not to scratch them. A spare is a good idea. On account of the curvature, these domes act as a lens underwater. If one wishes to focus on a subject at infinity, the actual focusing distance on the camera must be 4 feet. This causes some difficulties in practice, especially when one realizes that focusing via the ground glass is a tricky matter underwater. It is better to calculate the bellows extension before diving and leave the camera at this setting. With the aid of 45 lb of lead the camera can be sunk to the desired location.

For the operation of the slave-cell flash units, I always find difficulty in getting a diver who can remain patiently in the right position and hold the flash reflector in the correct direction. A misunderstanding of signals could lead to him changing his position and in so doing he may kick up clouds of sand which take anything up to half an hour to settle again. Hand-held exposure times of 1/30 sec. are perfectly safe. An underwater tripod facilitates matters greatly, enabling one to lengthen the exposure to an 1/8 sec. for a smaller aperture. The foreground can still be "frozen sharp" with the electronic flash.

Now this is all a lot of trouble, of course. The initial apparatus and techniques had to be improved gradually as I gathered experience. Yet it did enable me to put into practice the long-nourished wish to use a camera of larger format also in the submarine world.

Kamillo Weiß, Germany

Color page 57:

The top picture is a "snapshot" of the author working on his home-made, large-format underwater camera. Below is the view taken in by the camera: a coral bank with its inhabitants. Photos: Kamillo Weiß, Würzburg.

Color photo left:

Underwater photography is a fascinating but also difficult field for any photographer. True, divers are descending to ever greater depths and exploring the extremities of our oceans. Optimum photographic spoils, especially in the medium or large formats, will remain a rarity for some time to come, however. Sufficient illumination is the great problem here.





## ***CLOSE-UP PHOTOGRAPHY IN NATURE***

by Walter R. Schmidt

unsuitable for this kind of work. In the course of the years, one type of camera was replaced by another. After much thought, and giving due consideration to cost as well, I finally decided on the purchase of a Hasselblad 500 C. I have never regretted this decision, even although there are obviously limits imposed by this type of rigid camera.

Those readers who are both nature-lovers and photographers will know what I mean when I say that it requires infinite

*Top:*

"Couple après l'amour" is what Pierre Constans called his composition of the two butterflies. Actually, "composition" is not quite right, since they happened to land this way, looking rather like one insect at the first glance.

*Black-and-white page 62:*

The wings of an apollo moth.  
Photo: Hermann Geiger, Troisdorf.

patience and empathy to penetrate into the secrets of nature. As far as the camera for this domain is concerned, it is essential to possess one which accepts a long bellows attachment. Serious workers in this field will find, however, that it is hard to get along without a camera which incorporates various movements of the lens standard and back. Such a camera enables one to manipulate the depth of field and get more of the subject sharp.

For all of us the pace of life is becoming increasingly hectic today. The great achievements in science and technology hold us spellbound for most of the time. The result is that we no longer stop to admire those miracles which nature offers us, year after year.

As nature-lover and photographer alike, I have always taken a camera with me on my walks throughout the last 60 years. Previously I preferred to take landscapes, old framework houses, forged iron gates, and so on. Since such subjects no longer satisfied me after a time, I set out in search of other motifs. I soon discovered that the less conspicuous details in nature, which had always been present in great abundance on my wanderings, had received too little attention. The more I occupied myself with them, the more I was astonished at the richness of the forms and beauty of the wild plant life. I decided that in future I would try to become more familiar with the laws of photomacrography.

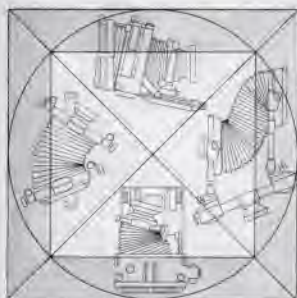
### **From a heavy wooden box ...**

My first camera, a heavy wooden box of considerable age, was obviously quite



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Section through the stem of a clematis in its first year.  
Hasselblad 500 C, Luminar 40, f 8.

Seed of a fuller's creeping thistle.  
Hasselblad 500 C, Luminar 40, f 8.







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Section through the stem of a spruce fir including the needles.  
Linhof Color 6.5×9 cm, Luminar 40, f 16,  
Photos: Walter R. Schmidt, Germany.

### Linhof monorail camera

For example, I also use a 21/4×31/4 inch Linhof monorail camera with a bellows extension of 340 mm. This kind of view camera also accepts various macro-lenses (I prefer the Carl Zeiss Luminar series) which get one as close as a ratio of 40:1.

To anyone who has not tried his hand at this game I can only say that I was very pleasantly surprised when I took my first glance into this completely new world of miniature proportions and have extracted much enjoyment from this hobby over the years.

Page 68:

Photo: Harry Langdon, USA.

Color photo opposite:

Parnassius apollo  
Photo: Hermann Geiger, Germany.

Color page 66:

Photo: Dr. F. Bode, Germany.  
Microphotography of a human headskin











# Flash versus tungsten

Although this topic has been worked over in detail by most photographic magazines at some time or other, it appears that some photographers are still in a quandary when it comes to choosing between these two sources of light. A recap on the subject might be useful to our readers:

## Electronic flash

Electronic flash tubes supply a so-called "cold light" of extreme brevity and which can be fairly finely dosed. The colour temperature of about 5000 °K permits one to work under conditions similar to daylight, e.g. at a uniform colour temperature, avoiding mixed illumination, and without the need of colour conversion filters. Movement can be "frozen" to receive a sharp image. Flash is advantageous for portraiture, since the pupils accommodate to normal ambient lighting and wrinkles on the model's face do not betray the discomfort of hot photo lamps.

Nevertheless, flash illumination without the added convenience of a modelling light has its drawbacks: anyone who is not familiar with artificial illumination techniques will find he has hard shadows in his pictures. More than likely, the prints will also appear flat, without any impression of depth, and the eyes of the sitter will be spoilt by a red spot. Bounce flash is not the panacea we had all hoped for. In spite of computer control it is still necessary to make a trial series under prevailing conditions.

## Incandescent lamps

Today there are still many photographers who would be very unwilling to forego tungsten lighting in their studios. Whether the reluctance of such photographers to make friends with the new medium is due to a lack of adaptability or lack of funds is hard to say and irrelevant here anyhow. Supporters of the incandescent source say that it is more easily controlled, maintain that it is simpler technically and point out the advantages of a reliable, well-proven lighting arrangement.

True, the image on the focusing screen as illuminated by, for example, halogen lamps, is bright, final and only needs to be measured for the exposure. However, artificial light generates heat no matter what the subject is, has a variable colour temperature and requires constant checking of the lamps. The light output is not only modest in relation to the bulk of the equipment but also uneconomical as well. One needs long exposure times, and this is accompanied by a whole host of drawbacks such as camera shake, reciprocity failure, etc.

## Conclusion

Every investigation into this subject has always ended up with the conclusion that a modern, efficient studio is hardly likely to get along nowadays without electronic flash in some controllable form. The disadvantages of yesterday's lamps are too numerous for any photographer to hope that he can work competitively with them. There are plenty of compact yet powerful studio flash units on the market today with which one can satisfactorily illuminate practically any subject in applied photography.



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